







With William Wesley Hson's
respectful compliments.

1886 .

J-25g

THE
HOUSE SPARROW.



“Ye are of more value than many sparrows.”

SB
996
S7G8X
1885
Birds

THE
HOUSE SPARROW;

BY
AN ORNITHOLOGIST,
J. H. GURNEY, JUNR.;

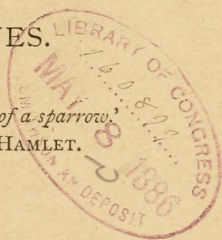
BY
A Friend of the Farmers,
COLONEL C. RUSSELL;

AND
THE ENGLISH SPARROW IN AMERICA,

BY
DR. ELLIOTT COUES.

'There's a special providence in the fall of a sparrow.'
HAMLET.

— — — — —
LONDON:
WILLIAM WESLEY AND SON,
28, ESSEX STREET, STRAND.



PREFACE.

THE publication of this little work on the Sparrow Controversy has occurred thus :

Owing to the great public interest taken in the subject, from the increase in the number of sparrows and their depredations in England, the Colonies and America, some demand had arisen for a pamphlet issued by the United States Government, by Dr. Elliott Coues, an eminent American Ornithologist. As the pamphlet could no longer be obtained from America, it was thought desirable to reprint it. In connection, however, with Dr. Coues' pamphlet, it seemed desirable to print at the same time some account of the sparrow and its depredations in England. With this view, the services of Mr. J. H. Gurney, jun., and of Colonel C. Russell were solicited, and kindly rendered, and their contributions form the principal contents of the present little volume. Mr. Gurney is known as an Ornithologist, and the author of works on his favourite science, and has made the House Sparrow a subject of special study. The perusal of his interesting and valuable contribution will supply proofs of this.

Colonel C. Russell, who contributes the second article, has made the Sparrow Question the subject of close investigation for fifteen years, and the results are given in interesting detail and fulness in his Article. Colonel Russell gave evidence of great value on the Sparrow and other birds, before a Select Committee on the Protection of Wild Birds, June, 1873. Colonel Russell, it may be added, cultivates one of the farms on his estate, and is known to many for his valuable contributions to the 'Report of Observations of Injurious Insects and Farm Pests,' by Miss Eleanor A. Ormerod. The publishers also desire to express their thanks to this lady for her kind assistance, without which, one of the following contributions would probably have not been obtained.

Dr. Elliott Coues is one of the most distinguished Ornithologists in America, and is the author of numerous books and articles on Ornithology. His greatest work is a 'Key to North American Birds,' etc., with 561 illustrations, a valuable work, the second edition of which was published last year in England, by Messrs. Macmillan and Co.

*

July, 1885.

CONTENTS.

	PAGE
THE HOUSE SPARROW: BY AN ORNITHOLOGIST -	I
THE HOUSE SPARROW: BY A FRIEND OF THE FARMERS	19
THE HOUSE SPARROW IN YARRELL'S BRITISH BIRDS	46
THE SPARROW ON OUR BILL OF FARE	49
THE ENGLISH SPARROW IN AMERICA	50
A RUFFIAN IN FEATHERS	63

THE HOUSE SPARROW,

BY AN ORNITHOLOGIST,

J. H. GURNEY, Junr.

THE common house sparrow (*Passer domesticus*; *fringillidæ*, the finch tribe) has some enthusiastic patrons in this country among the friends of dumb animals, and it has many deadly enemies among farmers and gardeners. I do not propose to enter into the charges brought against it by gardeners,* so much as to treat the question from a farmer's point of view.

No one can for a moment doubt that the sparrow question is now a very important one, and that it is becoming, year by year, more so; that is, if only a tithe of what has been said and written about it at farmers' clubs and in agricultural newspapers be true. A large farmer in Cheshire told his audience at a meeting last year that in his opinion sparrows, assisted by other small birds, had done the country £770,094 worth of damage in a year, reckoning a bushel per acre all over the kingdom (*vide The Times*, Sept. 13th, 1884, *Chester Courant*, Aug. 27th). If this tremendous estimate be anywhere near the mark

* Besides eating peas frequently and gooseberries occasionally, sparrows have an evil propensity for picking flowers to pieces, including the crocus, dahlia, polyanthus, hepatica, heartsease, and wistaria.

it may well be asked, 'Is any consumption of insects in summer likely to make amends for it?' Yet it appears to be the deduction of a careful man, made to a very sympathetic audience, who had suffered largely in their district, near Chester.*

THE POINT AT ISSUE.

The point at issue—and it is only by discussing it temperately that we shall arrive at the truth, and by entirely putting aside prejudice which has marked many utterances on the subject—is, Would the caterpillars and seeds of weeds, which the sparrows eat, consume, or injure, as much agricultural produce as the sparrows consume? And if the sparrows were all dead, it may be asked, 'Would other birds keep down these seeds and caterpillars as fully as they are kept down now?' Nineteen farmers out of twenty would say at the outset, that there can be no question at all about the matter—that sparrows do so much harm to crops, that *it is impossible that any number of caterpillars upon which their young are fed, can be enough to compensate.* On the other hand, the friends of the sparrow are equally one-sided. Having settled in their own minds that it is a mistake to destroy any small birds, and forgetful of the warnings which come to us from the United States and New Zealand, and every colony where the sparrow has been introduced, they

* Active measures appear to have been taken in that neighbourhood for reducing the number of sparrows. The following notices, in large letters, were posted up:—

'Wirral Farmers' Club. Notice.—Sixpence per dozen heads of Sparrows (until the end of March) will be given to anyone producing them to Mr. ———, Address: ———.'

I understand that the result was that several thousand sparrows forfeited their lives.

shut their eyes to its misdeeds, and will only look at its merits.*

'There can, I think, be no doubt,' writes the Rev. F. O. Morris, 'but that the harm they may do, even granting it to be considerable, is compensated, and more than compensated, by that which they prevent.'—*Brit. Birds*, ii., p. 278.

This appears to be the opinion of several other naturalists; and, although one fact is worth a peck of theories, their opinions are not to be disregarded.

THE HABITS OF THE SPARROW.

The various ways in which sparrows do harm to crops are well known to agriculturists; but, perhaps, by no one has the sequence of their proceedings in the field been better put than by the Rev. C. A. Johns (*Brit. Birds*, p. 202). Sometimes they make descents on the standing corn before the grain has attained full size, and near the hedges the busy pilferers are at work, and fly up in a swarm as you approach them; but when it is quite ripe they do the greatest harm. It is not only what they eat, but what they knock out.

A gentleman, who is a practical farmer in North Lincolnshire—Mr. J. Cordeaux—tells me he has seen acres which had the appearance of being threshed with a flail. Taking this into consideration, the opinion of the Melbourne (Derbyshire) Sparrow Club—that sparrows destroy a quart of corn apiece during the summer (vide *Zoologist*, p. 2299)—is probably true. If 30

* Some people are to be found who will even stand up for the ring-dove or wood-pigeon—a greater pest than the sparrow.

grains a day is a sparrow's ordinary meal during June, July, and August [and I do not think this is far from the mark, having repeatedly found 20 and 25 whole grains, and once, in November, 40, in a sparrow's crop], it would have eaten, during those three months, 2,760 grains, which is nearly a third of a pint; or if, take the whole year round, each sparrow eats on an average 15 grains a day, then each sparrow eats in a year 5,475 grains. This is none too high an estimate, for the quantity which sparrows eat at stacks in winter time equals what they take from the fields in the summer. During the operations of harvest, I understand they may often be seen sticking to the gradually lessening square of corn until all the field is cut. They then transfer their attentions to the sheaves, and also divide with the gleaners what is left on the stubble. Finally, when the farmer has sold his produce, sparrows take a very large toll out of any portion of it which a purchaser may give to his poultry, as every breeder of chickens and turkeys knows very well. At the end of September a marked decrease is to be seen in their numbers, but whether this is caused by real emigration or by local movements is not clear. It has often been said that sparrows come to us over the North Sea in the autumn; but among the numerous 'wings' I have had from lighthouses and light-vessels I have never received this species.* In October sparrows pack into flocks of from 200 to 300 and leave the homesteads. That month is mostly spent in the fields, and so is November; and here they find plenty

* But the nearly allied tree-sparrow (*Passer montanus*) is a well-known migrant.

of occupation, sometimes hunting on their own account, sometimes with other small birds. With the first fall of snow away they go to the stacks, on the sides of which they may be seen clustering; or, if it is not too deep, searching on the ground for grain which has been shaken out, with chaffinches and yellow-hammers. At all times stacks are a great attraction. It is said that preference is given to a wheat-stack; but sparrows are not particular so long as they can get grain. Needless to say, that threshing is a matter of the highest interest to sparrows.*

February and March are spent almost entirely in the vicinity of houses and farmyards, or any place where corn is to be found, unless, as previously mentioned, they are attracted to a distance by the operation of threshing. I agree in thinking that at this period the opinion of Colonel Russell, who continues the discussion after me, that corn forms 90% of their food, is true. At the end of March fields are sown, and sparrows show not infrequently, by their presence, that they wish to levy the usual tribute; but it is certain that where a drill is used the grain is deposited too deeply in the soil for any small birds to reach it, except skylarks, which are said to dig it up sometimes; but sparrows get the drilled barley and oats when they begin to sprout.

In addition to the remarks already made on this point—the damage done to corn by sparrows—it would be easy to cite many instances of great and unusual harm caused to tenant-farmers by sparrows, but they are too

* Mr. B. B. Sapwell remarks that when a stack has been threshed ever so far away from the yard, the sparrows in the yard have always had their crops full of the grain (*in litt.*).

vague for the purpose ; indeed, in such a matter it is exceedingly difficult to be precise. In some instances, and especially near towns, extraordinary estimates have been formed of the damage by the most competent valuers, but as these valuers were not Ornithologists, it is not clear that some of the damage was not done by greenfinches and chaffinches. I have seen large flocks in the fields in November, which I at first thought were sparrows, but which proved on closer inspection to be entirely composed of the species just named.

The following true story was related to me by Colonel Russell :—A farmer at Boreham, near Chelmsford, named Hurrell, had an early field of wheat not far from the village. The sparrows attacked it in the corner nearest the village and devoured a great deal there : the crop was uniform, except from what the sparrows did. Hurrell measured an acre where the sparrows had been at work, and an adjoining acre which they had not meddled with, and thrashed the corn on each of the acres separately, looking after the threshing himself. He found the deficiency to be 2 quarters (16 bushels) ; value at the time £6.

THE FOOD OF YOUNG SPARROWS.

The sparrow lays five or six greyish-white eggs spotted with brown and ash-colour, and has frequently three broods in the year, the first being hatched towards the end of May. Young sparrows in the nest are generally fed on caterpillars and other insects,* particularly in August, yet a good many may be opened in June and July without finding any in them. The parent sparrows will begin to feed them on caterpillars when but a day old, but they seem to discontinue the diet a little time before they leave the nest, though, on the other hand, some young sparrows, which were quite ready to leave the nest, examined in Norfolk, did contain a few small caterpillars. But of this I am sure, that while very young their diet is quite as much unripe corn and vegetable matter as caterpillars.† Even at the age of one day a sparrow will feed its young one on a grain of ripe corn. Say that a young sparrow eats 14 or 15 young caterpillars a day, that is probably as good a guess as we can make. If this only went on for ten days the sum-total destroyed would be very vast, and some of the caterpillars of very injurious kinds,

* An instance of young sparrows being fed on water-beetles occurred at the beginning of August, 1884. My father ordered a pond to be cleaned out, at the bottom of which were a great many small water-beetles; these, the gardener tells me, were eagerly collected by sparrows, ten or twelve at a time carrying mouths-full of them away to feed their young with in the adjacent nests.

† Colonel Russell says he has known young sparrows to be fed with ripe wheat, which he was able to prove the old birds had to go half a mile for.—*'Field,' June 22nd, 1878.*

such as *Caradrina cubicularis*, the pale mottled willow moth of Curtis ('Farm Insects,' p. 308), identified for me by Mr. C. G. Barrett and the Rev. J. Hellins.*

If one-fourth of the young sparrows hatched in England are fed for ten days on 14 caterpillars apiece, it is easy to make a calculation of how many they would eat in a large agricultural county like Norfolk. Norfolk contains 800 parishes: say that 800 young sparrows are annually hatched in each parish; that gives us a total of 640,000 sparrows. If one-fourth of them are fed on caterpillars, we should have 22,400,000 of these destructive creatures eaten in this one county alone, every year, by sparrows. So that there is a very nice balance to adjust in a matter which the most expert observer might find difficult. On the one hand the young sparrows are fed on a great many caterpillars; on the other hand they are fed with grain, but this is mixed with weeds and other vegetable matter. Again, there is a side light in which to look at the question:—If the sparrows were dead, how many of these caterpillars would be eaten by other small birds? We may be quite sure that a considerable portion of them would *not* be eaten, unless chaffinches and greenfinches become more numerous than they are now; and if this

* Several Continental naturalists include the cockchafer in the sparrow's food; but I think that most likely the 'chovy' (*Phyllorpertha*) is intended as well. Professor Newton (Yarrell, *British Birds*, part x., p. 92) and Mr. H. Stevenson (*Birds of Norfolk*, i., p. 211) tell us that the sparrow eats 'chovies,' *P. horticola*, and the former says he has seen their mouths literally crammed with them; and Mr. John Curtis says that he has known of sparrows gorging themselves to such an extent with 'chovies' as to be unable to fly (*Farm Insects*, pp. 220, 510). Prof. Newton says it begins to come out of the ground towards the end of May, and the perfect insect carries on its ravages until July (Prof. Newton, *In litt.*).

was so, would not they speedily become much more addicted to corn? I think there is not a doubt about it.

SPARROWS KEEP DOWN WEEDS.

Sparrows do much good to the farmer, in conjunction with many other little birds, by consuming vast numbers of the seeds of weeds. I think not nearly enough has been made of this by their friends and supporters. The following is a list of those which have been actually identified, with my authority for each :

Wild spinach (*Chenopodium bonus-henricus*), Mr. A. Willis.*

Knot grass (*Polygonum aviculare*), Mr. F. A. Lees.†

Black or corn bindweed (*P. convolvulus*), Mr. F. A. Lees.

Dandelion (*Taraxacum officinale*).

Goosefoot (*Chenopodium album*), Mr. F. A. Lees.

Field mustard (*Sinapis arvensis*), Professor Macgillivray.‡

Chickweed (*Stellaria media*), Colonel Russell.§

Mouse Ear (*Cerastium triviale*), Professor Macgillivray.

Wild radish (*Raphanus raphanistrum*), Professor Macgillivray.

Dock (*Rumex crispus*), Mr. F. A. Lees.

Pale-flowered persicaria (*Polygonum lapathifolium*), Mr.

F. A. Lees.

Buttercup, Mr. H. N. Slater.

These seeds will spread from a hedge, the sides of which are not brushed with a reaping-hook in the summer, and make a field very foul; so that everyone must admit that sparrows and small birds generally do some amount of good by keeping them down. A

* *In litt.*

‡ 'British Birds,' i., p. 344.

† *In litt.*

§ *In litt.*

remarkable instance was mentioned some years ago in the *Times*, of a field sown with grass and clover seeds, over which a luxuriant growth of knot grass (*P. aviculare*) spread. The farmer thought that his crop was ruined, but in September such swarms of sparrows as he had never seen before visited the field and fed on the small shining seeds of the knot grass. I regret that I have neither got the date of the letter, nor the name of the writer, the communication, according to a bad practice prevalent among observers, being anonymous.

A sparrow's crop will contain a great many small seeds. Dr. Schleh found 321 whole seeds of chickweed in the crop of one sparrow in Germany! In one shot at North-repps, in Norfolk, 147 were actually counted, and many more were ground up into pulp in the gizzard. Digestion is rapid, and at this rate a vast number would be consumed in a very short time.

It need hardly be said that the present contribution, including the Table which follows, does not exhaust the sparrow controversy. It leaves many interesting points almost untouched.

THE FOOD OF SPARROWS

DURING EACH MONTH OF THE YEAR.

SIX hundred and ninety-four dissections have been made in the preparation of the following Table, by various hands, in various places. They have been made at nearly regular intervals—certainly during every month of the year, and I may almost say during every week. It is therefore hoped they will give a reliable idea of what the customary food of sparrows is, and what their occasional food. I confess this latter phrase is somewhat vague, but have felt the necessity of employing it in default of a better. The column under this heading might no doubt be further extended.

Maize has only been entered under two months ; but where sparrows have an opportunity of obtaining it, maize would be found in their crops at any time of the year. They will also eat bread, potatoes, rice, pastry, raisins, currants, etc., but as these things have no bearing on the amount of harm which sparrows do to agriculture,* they are not included in the Table. Credit must be given to them as scavengers in a small way in our crowded cities, where they consume matter such as I have named, which, if left, would decay and be injurious to health.

Among those who have assisted in the inquiry my thanks are especially due to my father, Mr. A. Willis, Mr. B. B. Sapwell, Mr. G. Roberts, Mr. F. Norgate, Mr. C. L. Buxton, Mr. T. Southwell, Mr. T. E. Gunn, Mr. F. A. Lees, Mr. C. G. Barrett, Mr. H. H. Slater, and Colonel Russell. I have further availed myself of sundry notes

* If the pigs have barley-meal they rob them of some of it, as well as any other food which is given to them.

published in the *Zoologist*, by Messrs. Hepburn, Hawley, and Wilson ; and some material has been gathered from other scattered sources, which I have particularized in the Table.

FOOD OF ADULT SPARROWS.

	<i>Their customary food.</i>	<i>Their occasional food.</i>
JANUARY.	Corn from stacks and from poultry-yards ; seeds of all kinds.	Refuse corn, such as is scattered in roads, and would never be of use ; maize. Capsules of moss (H. H. Slater).
FEBRUARY.	Corn from stacks and poultry-yards.	Seeds ; buds of gooseberries (G. Roberts).
MARCH.	Corn wherever they can get it.	Young tops of peas, radish, cabbage, and cauliflower ; seeds (Wilson) ; freshly sown barley and oats.
APRIL.	Corn ; vegetable matter.	Freshly sown barley and oats ; oblong green seeds, not identified ; caterpillars.

FOOD OF ADULT SPARROWS.

	<i>Their customary food.</i>	<i>Their occasional food.</i>
MAY.	Corn; vegetable matter; seeds.	Young pea-pods and leaves of peas; gooseberry-blossoms and young gooseberries; small beetles; caterpillars of the Brimstone Moth, and White Cabbage butterflies (J. Hawley); turnip-seed (A. Hepburn and R. Lowe); hay-seed (C. L. Buxton); sprouts of young barley, half an inch long; pollen of the sycamore tree and apple (Note A, page 17); mangold-wurtzel leaves (B. B. Sapwell).

FOOD OF ADULT SPARROWS.

	<i>Their customary food.</i>	<i>Their occasional food.</i>
JUNE.	Corn; vegetable matter; peas; seeds of various sorts.	Gooseberries and other fruit; lettuces (A. Willis); small beetles; mangold-würzel leaves (B. B. Sapwell) (Note B, page 18).
JULY.	Young wheat, barley, and oats; vegetable matter; seeds of various weeds.	Peas; small beetles; beans (A. Willis); seeds of wild spinach (A. Willis).
AUGUST.	Wheat, barley, oats.	Seeds of corn, bindweed, knot grass, etc. (see list, page 9); aphides, small beetles, daddy longlegs (<i>Tipula</i>), caterpillars of <i>Teras contaminana</i> , moth of <i>Crambus cullmellus</i> (Note C,

FOOD OF ADULT SPARROWS.

	<i>Their customary food.</i>	<i>Their occasional food.</i>
AUGUST.		page 18) (E. F. Becher and F. Norgate).
SEPTEMBER.	Corn ; seeds of many kinds, especially the knot grass and corn bindweed.	Caterpillars ; berries ; seeds of plantain. (T. Southwell).
OCTOBER.	Grain, some of it refuse grain ; seeds of many kinds, including knot grass.	
NOVEMBER.	Grain ; seeds of plants.	Newly sown seeds of wheat ; small caterpillars.
DECEMBER.	Grain, principally obtained from stacks.	Seeds ; maize. Sprouting bean (H. H. Slater).

FOOD OF YOUNG SPARROWS TO THE TIME
OF LEAVING THE NEST.

	<i>Their customary food.</i>	<i>Their occasional food.</i>
MAY.	Grains of last year's corn ; small beetles ; cater- pillars.	Buds (F. Norgate). Red spider (J.H.G.). Hairworms(J.H.G.). Small flies (J. H. G.).
JUNE.	Caterpillars of vari- ous kinds, up to three-quarters of an inch in length ; young wheat.	Beetles ; large brown cabbage- moth(W. Johns); wireworm.
JULY.	Caterpillars, bee- tles ; soft, milky grains of wheat and barley.	Blue-bottle flies (J. Duff).
AUGUST.	Caterpillars, bee- tles ; young corn.	Small chrysalides.

DURING EACH MONTH OF THE YEAR. 17

To give a summary of this Table in a few words, it may be said that about 75% of an adult sparrow's food during its life is corn of some kind. The remaining 25% may be roughly divided as follows :

Seeds of weeds	-	-	-	-	10 %
Green Peas	-	-	-	-	4
Beetles	-	-	-	-	3
Caterpillars	-	-	-	-	2
Insects which fly	-	-	-	-	1
Other things	-	-	-	-	5

In young sparrows not more than 40% is corn, while about 40% consists of caterpillars, and 10% of small beetles. This is up to the age of sixteen days. Where green peas abound, as in market gardens, they form a much larger proportion of the sparrows' food than the 4% here stated.

Sparrows generally contain in their gizzards a considerable quantity of small stones, gravel, sand, brick, coal, etc., but these are only intended to grind the real food. In default of these substances they will swallow small mollusks, fragments of egg-shell, fragments of snail-shells, etc.

Sparrows should be killed for dissection in the afternoon. In adult sparrows the crop will generally give a far better idea of their day's meal than the gizzard, in which the food is so comminuted as to be with difficulty identified. If the sparrows are caught at night, they have digested their food in a great measure, and yield much less satisfactory results : the crops at that time are always empty.

NOTE A.

It seems that the actual blossom is not eaten, but rather that a portion of it is masticated for the drop of nectar at the base of the petals. For the same reason the crocus and other garden flowers alluded to at p. 1 (*note*) are destroyed. The blossoms of fruit-trees seem to be attacked for the pollen.

NOTE B.

Mr. R. Lowe has observed them feeding on the young unopened buds of swede turnips just bursting into flower for seed.—(*Report on Observations on Injurious Insects*, 1883.)

NOTE C.

I have notes of sparrows occasionally feeding on the yellow Underwing, Ermine moth, and a few other insects in the perfect state, but the date at which the observation was made not having been taken down, it can only be approximately guessed at from the time at which they usually appear. Everybody must, at some time or another, have observed their clumsy efforts to catch some common butterfly.



Peascod, emptied by a sparrow.

THE HOUSE SPARROW.

BY A FRIEND OF THE FARMERS,

COLONEL C. RUSSELL.

THE sparrow question has interested me from childhood ; the first definite observation I can remember was that of opening half-grown nestling sparrows some fifty years back, and finding in their gizzards ripe wheat about June 20, when none could be got in the fields ; the nearest place where it was likely to be found being a farmyard about half a mile distant. It struck me at once ; so much for calculations of the numbers of insects destroyed by sparrows, based on counting the visits of sparrows to their nest, and assuming that they carried in nothing but insects. From that time or earlier I have observed the habits of sparrows ; up to 1870 only loosely, and my impression then was that they lived mainly on corn, and though they took a few insects sometimes, that they no more lived on them than boys live on nuts and blackberries.

One most objectionable habit I have noticed from the first—that of turning the house-martins out of their nests as fast as they build them. A decrease in the numbers of the martins by this persecution has been going on steadily for the last fifty years, till they are, according to

my estimate, not one-fiftieth as numerous as they have been within my memory. Every year the martins are finally banished by the sparrows from numbers of places where they have built, in ever decreasing numbers, for years. I could give any number of instances of this. Passing through villages where formerly there were hundreds of martins, one now sees none, or perhaps some three or four nests, all, or nearly so, occupied by sparrows. In districts where any martins are still left, they will keep on building a nest or two in favourite places every year, only to be turned out of them; and particularly within a radius of a few miles round my place, which supplies a large yearly surplus of them, they try to establish themselves on every new suitable building—but all in vain.* Of all the colonies of martins that I have been acquainted with anywhere, I do not know of one now remaining, and the only successful new one within my knowledge where the martins are not protected by killing the sparrows (an exception which goes to prove the rule), is at the ruins of Thorndon Hall near Brentwood, burnt out a few years since. This house is in the middle of a park; probably the sparrows do not care to live there because no corn is to be had near enough to please them.

* To give one instance, a few years ago, seeing sparrows about a few martins' nests on a new small house near my own, I asked the man who lived there whether he liked the sparrows. He said: 'I hate them, and am throwing stones at them all day, but cannot keep them from the martins' nests.' I lent him a gun; his son, a boy about twelve years old, took kindly to shooting the sparrows, killed I think nearly 200 in less than a month, and always kept the place free from them; in two years there were twenty-four martins' nests on the house. The man then died, and the next tenant, having no son to shoot the sparrows, did not trouble himself about the martins, and the sparrows cleared them all out in one season. The martins have often built a few nests, but I do not think that any young ones have flown there since.

The martins, which feed exclusively on insects, if left in possession of their nests, would, unlike many other birds, increase with the population of the country and number of houses. Besides the persecution by sparrows, there is no condition unfavourable to the martins except that when, with their natural confidence in man, too often misplaced, they make their nests close to windows or doors for protection, people commonly destroy them; thus completing the exterminating work of the sparrows. I have heard it said 'they must come there for mischief; they might build anywhere else.' Few seem to notice that, unless where sparrows dare not come, the martins cannot keep a nest. The only thing which saves these birds from total extermination in this country seems to be this—they sometimes manage to rear a late brood after the 'fell adversary to house-martins' (as White of Selborne rightly called the sparrow) has left off nesting and betaken himself to the wheat-fields. But in this way the martins are kept here too long, and sometimes, before their young can fly, are caught by sharp frost in October, and die. The last numerous colony that I knew of, within a few miles of my house, was thus cleared out a few years ago, while my martins, protected from sparrows, and always getting their young off in good time, took no harm.

About my premises the martins, formerly numerous, as elsewhere became fewer and fewer until in 1869 they had nearly disappeared, young ones flying, I think, from only two nests—one close to a window, the other to a door. Towards the end of May, 1870, several nests freshly built under the eaves of the pigeon-house, their favourite place, were all found to be in the possession of sparrows. The indignation with which I had seen this persecution

all my life at last boiled over, and, resolving that the martins should have one safe place, I began to protect them by killing down the sparrows. It was a hard fight at first; the martins' nests had to be watched almost constantly, and, if I remember rightly, 150 sparrows were shot—mostly about these nests—in about a fortnight. War has been waged against them ever since. The first year or two we did not take the trouble to kill them in winter, but this did not answer; a great number lived about the place, many roosting in the martins' nests. When we began shooting the sparrows in spring they would all go away for a day or two, but kept coming back again, so that constant watchfulness for weeks was required to kill them down; the plan was therefore adopted of paying a penny for shooting each sparrow as soon as it shows itself all the year round. They are shot with very small charges of dust shot, mostly from inside doors and windows, or from loopholes made to command the places they generally come to; they dislike this practice, and do not come much—less and less every year. The plan has been most successful; the place is wonderfully free from sparrows—sometimes we do not see one for weeks together—and the martins have increased in numbers, till last year they had 170 nests about my house and buildings, and this year there are 237, and more will be built yet.

The food in the sparrows killed at first (June, 1870) was examined and found to be mostly corn and broken maize, for which they went to a farmyard nearly half a mile off. In this way becoming much interested in the subject, I investigated the food and habits of sparrows with special care during some seven years, and worked pretty hard collecting from a wide extent of country, and

examining the food in thousands, old and young ; old ones from all sorts of places at all times of year, young ones from wherever I could get any all through the breeding season. The result, confirmed by occasional examinations up to the present time, was that I found that sparrows destroy even fewer insects than I had supposed. The food in the old ones was almost all corn during the whole year ; green peas (of course bitten up small) were also found in them in summer ; and in May and June, when corn is scarce, a few wild seeds, chiefly of grass. No insect has been found by me in a sparrow between September and March. I have not often found one at any season (particularly between June and March) in a sparrow old enough to feed itself, and have very seldom found any number of insects in one—even when corn could scarcely be got. The food of young sparrows was found to vary greatly ; of those taken at the same time from one farmyard, some broods contained insects, some corn, green or ripe, or green peas, and a few green seeds, chiefly of grass, and in many would be a mixture of some or all these. The kind of food by no means always depends on the age of the birds ; the first food after being hatched given to a young sparrow is commonly a small green caterpillar, but large callow ones a few days old are often full of ripe wheat, and some ready to fly contain insects chiefly. My observations showed plainly that to get results of any value an investigation of sparrows' food must be made on a large scale ; otherwise very erroneous deductions may be made. For instance, once in June I found in forty-seven nestling sparrows of all ages from one farmyard scarcely anything except old wheat and green peas ; there were only about six insects in the whole number. From such an instance it might

be inferred that nestling sparrows are fed with little else than corn and peas, while another instance taken alone might be thought to prove that insects were almost their only food.

The following is, according to my observation, an outline of the life-history of a country sparrow. After being reared in the nest on some or all the sorts of food just mentioned, according to the notions of his parents (and these notions differ greatly with the same opportunities), if there is nothing ready for him in the fields, he lives, on corn and green peas if these things are to be found, about buildings, yards, gardens and roads (unless a field of early peas tempt him out sooner), till corn is forming in the ear, when he and his kind begin their ravages on it as soon as it will afford them a little milky stuff in the ears. If he does not leave the nest till this time or later, he quickly betakes himself to the cornfields. As time goes on, he and his fellows go further into and stay more in the fields, till, by September or earlier, most of them live in them altogether, sitting on the hedges by day and roosting in them by night, and feeding entirely on corn, until, generally at some time in October, all the corn on the stubbles is sprouting* or rotting; he then eats a few wild seeds; but when these and damaged corn are all he can get in the fields, he soon leaves them and goes home to houses and farmyards, getting his food with fowls and pigs, on the roads and at stacks, especially after these are threshed out. He lives thus till spring, except that at autumn seed-time he has a turn at the wheatfields, picking up what grain he can get at before it has time to sprout. In March I have sometimes found a small soft beetle or two, occasionally a small caterpillar,

* Sparrows, unlike larks, do not seem to like sprouted corn.

or often a piece of tender green leaf, among his cropful of corn. At spring seed-time he has another turn at the corn fields. In May and June he often finds it difficult to get as much corn as he would like, and goes eagerly to any place where he has a chance of getting it, but often has to make shift with wild seeds ; he seems, too, to like a little green grass seed with his old corn, and contrives to find some very early in the year ; most likely in warm sheltered places near buildings. I once found some sparrows full of chickweed-seed in May. At this season he gets wild seeds near houses, in gardens or meadows adjoining, but, so far as I have observed, does not go far into the fields for them. Now we come round to the time when he can get plenty of his favourite food ; perhaps green peas in June, and any amount of green corn in July.

A few town sparrows which I have examined, had little in them beside corn, much of which they get where fowls and pigeons are fed ; they get also unbitten oats and some grass-seeds from horse-droppings in the streets, as well as a good deal of bread-crumbs and other waste in towns. Sparrows leave towns and villages for a while, and go to the fields when plenty of corn is to be got there. At spring seed-time I have seen a great crowd of sparrows along the hedge of a newly sowed field near a small town. I believe that most of the London sparrows go out of town at harvest-time.

That sparrows live chiefly on corn is pretty evident, independently of any examination of the food in them. Where plenty of corn can be had for the greater part of the year, they will make shift for a short time with wild seeds or insects ; but where there is never any corn there are no sparrows, and where there is little of it but few.

Not many are to be seen in moorland countries where corn is not grown. I heard some years ago that at Mauritius, where they had been introduced, no corn being grown in the island, the sparrows kept to the towns and did not go into the country.

Of ripe corn, sparrows prefer wheat to oats, and oats to barley; probably because wheat wants no shelling, and oats are easily shelled. They neither like to eat barley with its husks, nor the trouble of getting these off; though in default of other corn they will eat it, sometimes unshelled, sometimes after partially or almost entirely shelling it. Sparrows like green barley, and it is often the first corn they can find in neighbouring fields forward enough to eat; they will then stick to it till it becomes too hard to shell well, when they leave it for the wheat. Some farmers in Norfolk sow a narrow strip of oats at that side of a wheat-field from which the sparrows are expected to come; the oats, being ready for them earlier than the wheat, keep them occupied and save the wheat for some time. Although sparrows feed greedily on green corn, yet while feeding on it they always like to get some ripe corn for a change, and will then go a long way to any place where old wheat can be got, as where straw with a little waste grain in it has been put down in a yard, or a haystack has been thatched with it. They will also turn over horse-droppings for unbitten oats in a road alongside a field of green corn which they are feeding on.

The destruction of corn by sparrows is very great, but varies so much in different places that I cannot pretend to guess the proportion of the whole corn crop of the country to which it amounts. The mischief is greatest near towns and villages. As an instance, a friend who, a few years back, had four acres of barley close to the

village of Writtle, near Chelmsford, told me that the sparrows devoured the whole crop, not leaving a grain.

Without going further into the detail of sparrows' food, the question whether they are or not, on the whole, useful to the farmer by destroying insects can, I think, easily be decided. They seldom go far from houses and roads into the fields except when they can get corn there, and then for the sole purpose of eating it, as the contents of their crops prove. Going through the fields in May and June, when most insects are given to their young, I seldom see a sparrow much more than a hundred yards from a house or road. Speaking broadly, it may be said that, unless very near houses and roads, sparrows take no insects in the fields. If they did any good to the farmer in this way, the land near their haunts would be worth more per acre to cultivate than the enormously greater extent of ground where sparrows never take an insect. But this is not the case. The greater ravages they commit on the corn are the only noticeable effects produced by sparrows on land near places always frequented by them.

With regard to wild seeds eaten by sparrows, I do not think that the land close to their usual haunts is perceptibly more free from weeds than elsewhere. I have not found weed-seeds in sparrows shot on the corn crops and stubbles till late in autumn; and a few days after half-rotten corn and wild seeds were found in their crops they all left the fields. I do not, however, remember working this out thoroughly to the last in more than one season. The sparrow seems to be 'a parasite on civilization' which has followed the cultivation of wheat from warmer countries (his rising later and roosting earlier than other birds, in the warmest places he can find, point to this), and living and sleeping in the fields does not suit him

unless in warm weather ; so cold, as well as want of corn, may have something to do with driving him home. In seasons when much rain spoils the corn on the stubbles early, and the weather keeps warm, some of the sparrows which have made the fields their home ever since they flew from the nest may perhaps stay in them longer after the grain is all spoilt, and eat more wild seeds than in drier and colder seasons. I heard from Mr. J. H. Gurney that he found much weed-seed in sparrows last autumn. There was rain enough in September, 1884, to sprout the grain on the stubbles, followed by very warm weather. Difference in the seasons may account for the difference between his experience and mine. Sparrows eat weed-seeds in the fields only when they can no longer get corn there, and, I believe, generally but for a short time.

Finches feed on them much longer, remaining in flocks on the stubbles long after all the corn and sparrows have disappeared thence. Linnets depend so much on wild seeds that they are numerous only on or near waste ground which will provide them with a constant supply of them. These birds are scarce here, but I have known a number of them to stay all the summer about a field foul with chickweed. The greenfinch feeds chiefly on wild seeds, and, I think, prefers them to corn ; he does very little harm to the farmer, unless he grows seeds of the turnip and cabbage class (*cruciferae*). I have found scarcely any seed of this class, cultivated or wild (including charlock) in house sparrows, while the crop of the tree sparrow (the indigenous sparrow of this part of the world) is commonly full of it. The few wild seeds I have found in sparrows have not mostly been those of weeds particularly troublesome to the farmer, and my observations have not led me to believe that these birds do any

appreciable good by eating them. If I am right in the similar conclusion I have come to with regard to insects, any good the sparrow may do is a question for the gardener.

In gardens sparrows do much mischief, as by feeding off young peas, eating green peas from the pods, stripping gooseberry bushes of their fruit-buds, destroying flowers, etc. The question remains whether they do good enough in gardens to make up for such misdeeds. Now, to prove that sparrows are really useful, it is not enough to show that they destroy some injurious insects ; it must also be proved that, in their absence, other birds would not destroy them, at least as effectually. This can be found out only in one way—by banishing the sparrows from a place for some years. My object in letting no sparrows live about my house, buildings, and garden has been not only to protect the martins (perhaps it would be enough for this to kill those sparrows only which go near their nests), but also to get a better test of the utility of sparrows than could otherwise be got by any amount of examination of the food in them. My place is a fair specimen of the country, having flower and kitchen gardens, shrubberies, and small orchard, surrounded by meadows, with cornfields within easy reach all round. All birds except sparrows have been let alone there.

Sparrows having been almost entirely absent for many years, if they took insects which other birds do not, such insects would have become very numerous, and the food in sparrows killed there would show this. Now it has been quite as unusual to find an insect in an old sparrow there as elsewhere. Fifty old sparrows, and young ones which could feed themselves, were killed one summer about my buildings and garden, with food in their crops.

This food, carefully examined (as in all cases, with a lens), was found to be corn, milky, green, and ripe, and sometimes green peas from my garden ; only two small insects were found in the whole number. The food in them has been much the same every year. Examining the old birds, however, is not test enough, as they eat very few insects anywhere ; but if any were the peculiar prey of sparrows, they would be found in quantity in any young ones bred about my place. To test this, when a pair or two of sparrows, as happens most years, contrive, by keeping clear of the buildings, to escape being shot long enough to build a nest and hatch young ones, these have been taken (by choice when about half-grown), and the food in them carefully examined. It has varied greatly, but certainly there were not more insects among it, I think less, than there usually are where sparrows abound. In the only nest known of one year, the food in the four young ones was chiefly green peas, with some grains of green wheat, one small beetle, and some half-dozen small insects of species unknown to me. In the only nest the following year the young ones had little in them except corn—old wheat, if I remember rightly. Some broods have contained small beetles (which, mostly soft ones, I have found in sparrows old and young, from all sorts of places, oftener than caterpillars) and a few wild seeds. One brood had a mixture of beetles and ripe wheat. One grasshopper's leg and a very few pieces of earwigs have also been found. Of caterpillars, said to be kept down by sparrows, only two small ones in eight callow birds, from two nests taken at the same time, have been found in all the years that these nestlings have been examined, and no trace of an aphid. The absence of caterpillars is the only difference that I have noticed in

the character of the insect-food in young sparrows at my place and elsewhere. On the whole, the deduction from the food test during fifteen years seems to be that the sparrows are useless, and that the insects which would be given to their young by them if they were allowed to live in numbers about my premises would be so much food taken, when they most want it, from better birds which live entirely, or nearly so, on insects, and thus keep them, especially caterpillars, down so effectively in the absence of sparrows that, when a chance pair of these come and build, there are few of their favourite sorts for them.

After the almost total absence of sparrows for many years from my garden, everything seems to do as well as elsewhere, many things much better. Young peas need no protection from birds, young lettuces are not eaten off, green peas are not picked out of the pods (except one year in the fifteen, when the ox-eye and blue tits devoured all the late peas), and the gooseberry buds are not picked out; the crops of this fruit have therefore been very heavy year after year. Before the sparrows were banished, at some time in winter, the gooseberry buds were often nearly all picked out (the bushes are sometimes killed in this way). This mischief would be done in a few days, when nobody happened to be about the garden; it was impossible to know when it would be done so as to catch the birds at it. One thing seemed to show that titmice, commonly accused, were not the culprits; a few buds were always left untouched at the end of every shoot otherwise stripped of them. This looked like the work of sparrows or finches; they could not get at these because the end of the twig would not carry them; but a titmouse, with his strong clutch, could easily get at the buds there, hanging, as he often does, back downwards. It has often

been said that birds take buds to get at grubs or insects in them, which would have destroyed the buds. I believe that this is a pure fiction, without any foundation in fact ; at any rate I never met with or heard of a case in which it could be proved, or seemed at all likely. It would be against common sense to suppose that all the buds on a number of bushes held insects except those near the ends of the shoots, and that none of these held one (they always grow well enough). When the birds have been budding the bushes, and the few buds left burst into leaf, besides those at the ends, here and there one does so on the stripped parts, and perhaps nine times out of ten the reason of its being left is plain—the bud contained no flower. Anyone can verify this fact. I have heard it said ‘the birds must take the buds for insects, you may find the buds dropped on the ground.’ This is a specimen of the slipshod observations and inferences that people too often make. Birds shell the buds, and seem to eat only the part which would form the flowers ; this is most easily proved in bullfinches, for they will come to a garden or orchard and live there exclusively on fruit-buds. I once shot one on a cherry-tree full to the mouth with its buds ; these were nicely shelled to the part which would open into the bunches of flowers, looking something like little cauliflower heads, and showing the little blossom buds. Bullfinches, however, did not do the rapid budding already mentioned ; they are rather scarce here, and come one at a time—sometimes not at all during a whole winter—and one or two could not do nearly so much work in the time. We know well enough what they do ; when they come they stop, and are sure to be seen before long. I am unwillingly obliged to make an exception, and allow bullfinches to be shot in the garden in winter ; not in

summer, for neither they nor other birds do any harm in my garden to buds after they have opened, nor to the fruit-flowers. I have heard of such harm, but have never met with an instance of its being done.

Other birds are often blamed for the misdeeds of sparrows, and killing out these is the best way of finding out what mischief is done by them and what by the others. It showed me plainly that the sparrows were guilty, and that greenfinches, chaffinches, and titmice were innocent, so far as buds, lettuces, and generally peas were concerned. If the finches have taken any green peas at all, they have not done so to a noticeable extent. The greenfinches and chaffinches are so numerous in my garden that they would eat every seed of cabbage, radish, and other cruciferæ, were the seed-beds not netted ; if a net anywhere lies on the ground, scarcely a seed escapes them there. They often get under the nets and cannot find their way out, so there is no doubt as to what birds eat these seeds. I believe that sparrows will eat the seeds of some, at least, of the cruciferæ, when sprouting, but in this respect the finches are as bad or worse. It is, however, easy to net the beds, and then, so far as I can see, the birds in question do no harm in the garden. Chaffinches destroy a good many insects ; I think many more than sparrows. Titmice abound in my garden ; they destroy a great many caterpillars when they have young ones, and, unless when they take the peas, do no harm in the garden except to fruit, particularly pears, by picking small holes in them near the stalk. They are very destructive in this way. The results above described go to prove that sparrows are much worse than useless in the garden.

Like other corn and seed eating birds, sparrows do not

eat fruit much ; they will, however, sometimes attack the cherries, and then do so very wastefully, pulling them off and dropping them. The question whether sparrows protect foliage to a perceptible extent, can easily be decided by comparing roadside hedges, always frequented by them, with those far in the fields, where they do not go at their insect-taking season. So far as I have observed, the leaves are not more eaten by caterpillars on the latter than on the former.

Birds' friends and foes seem to agree in thinking that all small birds are alike, though differing in food and habits as much as sheep and wolves. This is a great mistake : some birds do us nothing but good, others are of a mixed character ; and whether these do us more good or harm may depend on circumstances. The sparrow differs from other more or less mischievous small birds, much as rats do from squirrels and fieldmice. Those who, wishing to destroy sparrows, shoot also every other small bird they come across, thinking them all much the same, kill out all the other sorts before they can thin the numbers of the sparrows to any extent, so much more cunning are these. If stories about the ill-effects of killing sparrows have any foundation in fact, these ill-effects were doubtless due to killing the useful birds as well.

Sparrows have been introduced into new countries, as America, Australia, and New Zealand, and evil reports are made of them in all. So far as I know, in those countries, nobody pretends to say from practical experience that the sparrows do any appreciable good to make up for their ravages on corn, etc. I was in North America for sixteen months thirty-five years ago. There were no sparrows there then, things went well without them ; and I

thought the country fortunate in the absence of the vermin. It is creditable to the 'cuteness of Americans and colonists to have found out the sparrows so quickly, while here people never seem tired of writing nonsense about the benefits conferred on us by 'sparrows and other small birds.' Where sparrows, however, have recently been introduced, people are much better able than we are here to judge them justly, because they can remember how things were before the pests were brought there, while here, where they have abounded for ages, when people say (just as they would in the new countries, had sparrows always been there) that we could not live without sparrows, they cannot be contradicted with the same certainty, because we have no experience of what would happen in their absence. On a small scale I have obtained an advantage like that of the Americans and colonists; it is very desirable that the same experiment should be tried on a large scale, by killing out all the sparrows for some years, not only in gardens, but throughout a large district—the less other birds were killed the better the experiment. In this way only can the sparrow question in this country be settled beyond all dispute.

On the whole, taking together the results of the introduction of sparrows into new countries, those of my experiment of banishing them, and of my examination of their food and habits, it is my decided opinion that the entire absence of sparrows from this country would be a great benefit to all, especially to farmers and gardeners.

Even if the harm done by the sparrow were balanced by good done in destroying insects and weed seeds which would not be taken by other birds, his banishment of the martin would condemn him, for the martin is no doubt a far more useful bird. For about six months in the year

(during part of which same time only does the sparrow take any appreciable number of them) the martin lives here entirely on insects, and does no harm at all. Not liking to kill martins, I cannot give a list of the insects they feed on, but know that they destroy tipulidæ (daddy-longlegs class), beetles, moths, and winged aphides. Biting-midges were certainly unknown in the district in which I was born and brought up and still live, while we had plenty of martins ; but when these had nearly all disappeared some thirty years ago, the midges came and remained ever since in such numbers, and bite so viciously, that no one can sit in a garden on a calm evening from May till October. Whether these things were cause and effect, or mere coincidence, I do not know ; but since my martins have again become numerous, the midges have nearly disappeared in my garden, from which for years they used to drive us. As they drift with the wind like fog, and one colony of martins cannot clear the country of midges for many miles round, my place cannot be expected to be always quite free from them.

If martins abounded, as, in the absence of sparrows, they would almost everywhere, they would do an immense amount of good, coursing about over gardens, meadows and fields, and destroying multitudes of injurious insects in the winged state, especially when these are shifting their quarters to new ground. I am under the impression that there have been more complaints of red maggot in wheat-ears since the martins have become scarce ; it is not unlikely that they may take the parent wheat-midge, as well as turnip-fly (or flea)* and beetle which breeds

* A neighbouring farmer has just told me that he has seen my martins in hundreds flying close to the ground over seed beds of cabbage, etc., taking turnip-flea springing, as is their habit, a few inches from the ground.

wireworm, at any rate when they are travelling through the air.

If people everywhere could be induced to take interest in the preservation of martins, farmers and gardeners would derive great benefit, not only from the good which these birds would do them, but even more from the lessening of the numbers of sparrows which would ensue, seeing that martins cannot be kept without killing the sparrows. In no other way is this most desirable effect so likely to be brought about, particularly in the case of sparrows which come out from towns and villages to harry the fields. Many townspeople like sparrows, thinking that they are the only birds which will live in towns. They do not seem to know that if there were no sparrows, they would have, instead of them, plenty of martins, as much pleasanter to look at as squirrels are than rats. White, in his 'Natural History of Selborne,' said, 'There are few towns or large villages but what abound with house-martins.' The sparrows persecuted them badly in his time, and he had had them shot when they deprived his martins of their nests. Most towns, and the outskirts of London, would certainly again be full of martins, if they had fair play. How far they would go into the crowded part of London I cannot say, but, a few years back, some of their nests were built at Westbourne Grove. This shows that they could find food in or near the crowded parts.

Among all the sentimental writing about birds, we never find a word about the extermination of the best of them by the worst. Yet the martins are no doubt the most desirable birds to have about our houses, even apart from their utility. They are less graceful in their flight than swallows, but their far greater numbers where they can keep their nests, their habit of nesting and flying in

company and generally higher, and their bright black and pure white plumage, make them a better feature in the view, and from April to October they show far more life in the air near houses than all the rest of the birds put together. To any one used to see them, a place looks dull in summer without martins. No birds are more amiable and kindly among themselves, or show more confidence in man. The habits of none are more interesting or more easily observed. It seems strange that people do not see all this, and the cruel persecution of martins by sparrows, which will often pull small young martins from their nests and drop them on the ground—or, seeing this persecution, can feel towards the sparrows otherwise than they would towards rats, if seen constantly carrying off young chickens. I wish that all the sparrow advocates could see my martins, that they might know how much they lose by tolerating the sparrows, which comes to the same thing as killing all the martins. This indifference on the subject is partly due to the scarcity of martins—few are now acquainted with or know anything about them. When they were plentiful and well known they were held almost sacred. People acquainted with them cannot but like martins; in Lapland they put earthen pots on their houses for the martins to nest in; American Indians of old used to hang up gourds near their lodges for their purple martins. English cottagers generally feel kindly towards the martins, but cannot protect them from the sparrows. Well-to-do people will not let them build about their windows or often even on their houses, and the sparrows will not let them keep a nest on their out-buildings, so there are no martins about them to become acquainted with. The disappearance of the martins is a loss really of national importance, and it is much to be

wished that some colonies of them should be encouraged, that people might see what they are like. Farmers particularly have an interest in doing this ; it is very important to them that people in towns and villages should have some motive for destroying sparrows.

One accusation, and only one, is commonly made against martins ; that they bring bugs into houses : after full and careful investigation I can say with certainty that this is a mistake, but it is a very natural one for those who do not look closely into such things. Martins' nests are infested by a parasite nearly allied to that in question ; this is a distinct species, never grows to half the size of the other, its habits are different—for instance, it will come out of the nest and run about in full daylight, when seen much to the detriment of the poor martins ; it will not live in a house, and is perfectly harmless to man. In proof of this, numbers of martins' nests have been built on my house for many years ; there are now, besides those on outbuildings adjoining, thirty-nine nests built on the house near the windows, and there is not a bug in it ; not one of these, or of several other parasites that infest the birds and their nests, have ever been seen in the house. Swallows' nests are infested by a very similar parasite, but larger and of a darker colour, also perfectly harmless to man. These must often fall from the nests down the chimneys, but are never found living in a house ; fortunately for the swallows, their nests are where people cannot see these parasites about them, and the swallows' reputation is not damaged.

A few words may here not be out of place about the effect on the number of other birds of the absence of sparrows from my place, and of the consequent abundance of martins. Before and since the martins have become

numerous we have had plenty of swallows: from the places they are in their nests cannot well be counted, but their numbers seem to vary much from year to year. My general impression is that the numbers of swallows about a place are but slightly diminished by the presence of a great number of martins; and I do not see that swallows increase much in numbers where the martins disappear. As the two species do not displace or replace each other to any great extent, it would seem, though they probably eat some insects in common, that their food is mainly different, and that we need both species to destroy different insects. So far as I have observed, swallows as a rule take larger insects than martins. From the fact that the martins can maintain themselves in far greater numbers about a place, it is evident that their peculiar food must be much more abundant than that of the swallows.*

Besides those already mentioned, most common birds abound in my place; these are all more useful or harmless, or both, than sparrows, and I think that most of them do better and are more numerous for the absence of these. It is difficult to make out and speak positively about partial displacement of other birds by sparrows. So many things may affect the numbers of various birds, and it is impossible to know how many of each species would be at my place were it infested with sparrows, and, again, how far, in the absence of sparrows, the numbers of other insect-eating birds are affected by my multitude of martins. I can only say what is my general impression. The harmless and useful hedge-sparrow for instance abounds, thriving in bad times on waste which would feed his greedy namesake, were he tolerated here. No doubt

* The insect food of these and other birds is a subject which much wants investigating.

much of the sparrow's food is waste, about houses as well as roads and fields ; but this waste in his absence would go to support better birds. Chaffinches feed on the roads like sparrows, so far as they give them a chance, and would be more numerous in their absence.

It may be said—in the absence of sparrows, would not other corn-eating birds increase enough to do as much mischief? My answer is that finches in the same numbers would be much less mischievous than sparrows, not having so great a preference for corn, and living more in the fields on wild seeds. Again, finches could not increase to the same extent as sparrows, as will be explained presently. Yellowhammers are very fond of corn, but their numbers have in most parts been reduced to a small fraction of what they formerly were by the practice of trimming the sides of hedges and ditches in summer, and so cutting off the supply of coarse grass seeds which support these birds when no corn is to be had. Yellowhammers will never be numerous enough to do serious damage. It has already been shown that finches are much less mischievous than sparrows in the garden. Yellowhammers, so far as I have observed (and they are numerous here), do no harm in the garden, unless by eating grass seeds sown on a lawn.

The only birds which seem to have become fewer here during the last fifteen years are blackcaps and garden warblers, which are among our best singers but are most voracious fruit-eaters. Both species were numerous here till the martins had fifty nests, when most of the blackcaps disappeared rather suddenly, and garden warblers two or three years later ; there have been but a few of each species every year since. This looks as if these birds which live on insects till the fruit begins to ripen

have been in great part displaced by the destruction by the martins of the winged insects which would breed the larvæ which blackcaps and garden warblers feed on.

Flycatchers, which live on flying insects, and wagtails and redstarts, which do so to a great extent, are at least as numerous here as I ever saw them anywhere. Some of the wilder birds, as the ring-dove, stock-dove and turtle-dove, always breed near the house, and are not disturbed by shooting the sparrows, having quite sense enough to disregard noise which does them no harm. I may here remark that the sparrows are not often shot in the trees; it is almost useless to try to do so, to say nothing of the risk of shooting other birds by mistake. When a few sparrows, avoiding the buildings, try to live in the trees, the fowls' food soon lures them to their fate.

It seems to me that the numbers of sparrows have long been and still are greatly increasing, till they have become in many parts a serious evil to the farmer. The reasons for this increase are plain enough; sparrows breed very fast; I know not how many times in the year, but many of them lay soon after April 20; they nest all through May, June, and July, and a few have come to build in my martins' nests in the first half of August. But the numbers of any wild creature depend less on its natural rate of increase than on checks, the chief being the want of food at the worst times, especially in the case of domestic parasites like rats, mice, and sparrows. These have no natural enemies in the way of wild birds or beasts of prey to thin their numbers to any extent; consequently they must be kept down by man, or they will only be limited by starvation, and will always increase up to the point which the lowest period of food

supply will allow. Now people generally do not destroy sparrows, or even take their nests to any extent, less I think than formerly, some because they do not care to take the trouble, others because they are deceived by what they read about 'sparrows and other small birds.' Many things keep increasing the food-supply of sparrows at bad times; perhaps the chief thing is the greater number of horses used and oats given them, and consequent increase of food for them on the roads at all times of the year. If all oats given to horses were crushed, the numbers of sparrows would be much reduced; removing the droppings from the streets of London has of late years greatly lessened the numbers of sparrows there. Another thing in their favour is the change from the old plan of threshing by hand in the barn, whereby the waste grain went into the farmyard, where most of it was eaten by pigs and fowls, the sparrows having to compete with them to get any. There are therefore, as a rule, fewer sparrows to be seen in farmyards in winter now than formerly, but a great many more along roads, especially near stacks. These being of late years threshed out by machine in the fields where there are no pigs or fowls, the waste feeds the sparrows for a long time. In the part where I live, after a stack has been thrashed out, the straw is taken away a little at a time, each removal exposing a lot of waste corn which, with what they pick up on the roads, supports a dense shoal of sparrows for weeks or months. In many ways, too, the increase of population and wealth in the country promotes the increase of sparrows by supplying them with food, waste or otherwise, in the worst times for them—that is, when there is least corn about—worst of all, when the ground is covered with snow.

Though originally a warm-country bird and sensitive to cold, the sparrow knows but too well how to take care of himself here, and, from his habits and knowledge where best to find food at bad times, is much less liable to starvation in frosty and snowy weather than other birds. In the three severe winters, 1878-81, the ranks of most common birds were so much thinned that it has taken three or four mild winters to restore them to their usual numbers, while the sparrows, so far as I saw, did not become sensibly fewer.

For my part, I believe, and, so far as fifteen years' trial goes, find it so, that we can do as well without sparrows as without rats and cockroaches. If farmers destroy all their own sparrows, they will still suffer from the swarms that come out from towns and villages.

NOTE.

It would be vain to expect people in general to exert themselves to abate the nuisance, especially as sparrows are at least as cunning as rats; and the usual methods of netting are not very effective. What we want is some plan which would enable one man to keep a village, a very few a town, nearly free from sparrows. I think that I have devised such a plan, on the principle of a decoy-pipe: it is not worth while to describe this, before trying it.

A few hints derived from long experience may be useful to any one who wishes to investigate the food of sparrows himself. To examine the food in an old sparrow the best plan is, if anything can be felt in it, to take out the gullet. This can be done very quickly with the fingers thus: open the feathers between the back and side of the neck, and tear open the loose thin bare skin there; this will expose the wind-pipe and gullet. Having rubbed down from outside any food near the mouth, take hold of and break off the upper end of the gullet, pull out clear of skin and feathers, and then take hold of and break off the lower end of the gullet. The food can now be pressed out from the skin-bag, or this may be kept till convenient to cut open. Sparrows killed just before they go to roost mostly have their crops full; their digestion is quick, and little or nothing is likely to be found in the crops of those caught at night at roost, or shot in the morning. The food goes a little at a time into the gizzards of old sparrows, and is there soon too much ground up to be worth

examining ; but in the crops the most delicate insect, if there, can be detected.

When first hatched, a sparrow's gizzard is small, but it quickly increases in size, till by the time the bird is half grown—'stump feathered'—it has become a large bag, very different from and much larger than that of an old one. Up to this age, at which nestlings have most food in them, there is no enlarged gullet or crop, and the food goes straight into the gizzard ; so this must be examined to find out what young sparrows have been fed with. As the bird becomes feathered, the gizzard becomes smaller and harder ; by the time it can fly the gizzard is like that of an old bird. Young sparrows, like old ones, have most food in them towards evening ; if taken early in the morning, little will be found in them. A watch-maker's lens answers well to examine the food ; with it the skin of the smallest caterpillar can be made out.

Many people have rather hazy notions about the Wild Birds Protection Acts, and some may think that they forbid the killing of sparrows during close time. Now the Act of 1880 states that the section prohibiting the killing or taking of Wild Birds between March 1 and August 1, 'does not apply to the owner or occupier of any land, or to any person authorized by the owner or occupier of any land, killing or taking any wild bird on such land not included in the schedule hereto annexed.' The sparrow is not included in the schedule, and therefore the only protection given by the Act to sparrows is that it forbids killing or taking them on other people's land without leave between March 1 and August 1. The Act of 1881 (to explain that of 1880) simply legalizes the sale of birds legally killed in close time, and puts the lark into the schedule.



Wheat-ear—after the sparrow.

YARRELL'S BRITISH BIRDS.

MANY of our readers may have read the observations on the Sparrow in the second volume of this work, the fourth edition of which is just completed. As the work is in deserved esteem, and the editor, Professor Newton, is a very accurate observer, the following short extract is taken :

‘It may freely be admitted that in many instances the damage done to peas and ripening grain is incalculable ; but equally incalculable is the service as often performed by the destruction of insect-pests. Not only are the young, during the earlier part of the breeding-season, mainly fed on destructive caterpillars, but the parents, for their own sustenance, then capture, even on the wing, a large number of noxious insects in their perfect stage.’

Most of the readers of this little book will probably think that Mr. Gurney and Colonel Russell have well reckoned up the ‘incalculable service’ rendered by sparrows in the destruction of injurious insects. Perhaps Professor Newton himself might admit that Mr. Gurney and Colonel Russell have bestowed more time and labour in the investigation of the habits of *this particular bird* than Professor Newton has found possible.

In a note on page 96 of Yarrell, Professor Newton refers to the introduction of the sparrow in North America, New Zealand, Australia, etc., and adds, ‘in most of these places it will of course oust some of the indigenous species, and will most probably in a few years

become an intolerable nuisance.' Much might be said here of other colonies, but the professor's prediction in regard to Australia, at any rate, has been amply verified ; for we read :

'The "sparrow question" is one of the most practical and perplexing which the Melbourne Government is now striving to solve, but apparently it is beyond its powers. Many of the sufferers have been summoned to give evidence as to the amount of damage done by the sparrows, and the result proves them to be an infinitely worse plague than either blight or caterpillar. One man tells how in ten days they cleared his vineyard of a ton and a half of grapes, and stripped five fig-trees which had been loaded with fruit. Another had lost £30 worth of fruit from a comparatively small garden. A third had fifteen acres of lucern grass destroyed. A fourth had to sow his peas three times, and each time the sparrows devoured them. A multitude of similar cases are reported.'

In England the increase in the number of sparrows seems to keep pace with the increase of the population and the number of houses. Wherever a new house or cottage is built, it is no sooner inhabited than it receives its family of sparrows. In some of our colonies, however, and notably in North America, it increases with astonishing and alarming rapidity. The climate, the abundant supply of food, and other causes favour their increase.

Professor Newton says, very truly, they 'will of course oust some of the indigenous species.' This they have done in America. 'In place of many sweet songsters which used to grace and enliven our streets,' says Dr.

Coues, 'we have these animated manure machines, as every house-owner knows to his cost.'

In London, as we have the largest population—'without feathers,' as Carlyle says,—so have we the largest sparrow population of any city in the world. We have counted a hundred at one time upon the grass in the Temple Gardens, to say nothing of hundreds upon the trees and the surrounding roofs ; and it was pretty to see them.

The grounds of Lambeth Palace, where, twenty years ago, were to be found thrushes, blackbirds, chaffinches, and other country birds, now swarm with nothing but sparrows. The gardens in our suburbs, where formerly other birds were common—or not uncommon—have now nothing but sparrows. An occasional visitor is seen—a robin, wren, or titmouse, but it disappears in a day or two. It is a belief that this is due entirely to the increase of sparrows. As Londoners, this is nearly our only grudge against them : we feed them well.*

* In severe winters a variety of beautiful strangers re-appear and appeal not in vain to our charity. The greatest number was in the severe winter of 1880-81. We had then in our garden (Clapham) thrushes, blackbirds, red-wings, chaffinches, bullfinches, robins, wrens, and titmice, and starlings in great number.

*

SPARROWS ON OUR BILL OF FARE.

WE read, 'are not two sparrows sold for a farthing?' and again, 'are not five sparrows sold for two farthings?'—a proportion in favour of the larger purchase. In some countries on the Continent large numbers of small birds, including beautiful singing-birds unfortunately, are offered for sale in the poultry markets. English people, as a rule, look down on this sort of fare. A sparrow is a poor meal for a man to sit down to! True, but a score or so of the birds, when they are fat and in season during the autumn, make a very toothsome pie. And 'sparrows,' says an excellent cookery book, 'are excellent eating, if cooked in the same way as larks.'^{*} Our American friends, we learn, have taken to sparrow-pie lately, thereby diminishing the number of these destructive birds, and making an agreeable addition to their bill of fare. Our friends in the country will do good all round if they do the same, and induce others to follow the example.

*

In Lorraine I have seen circular earthenware pots hung up against the walls of cottages in several villages, for the house sparrow to nest in—the intention being to eat the young ones.

J. H. G., JUNR.

* 'Modern Domestic Cookery.' Murray.

ON THE PRESENT STATUS OF PASSER
DOMESTICUS IN AMERICA.

WITH SPECIAL REFERENCE TO THE WESTERN STATES
AND TERRITORIES.

By DR. ELLIOTT COUES, U.S.A.

NOW that the enormous increase and rapid dispersion of the European house-sparrow in America have resulted in the appearance of this objectionable bird in various portions of the Western States and Territories, it is time to consider what means may be taken to check its westward extension; for the agriculturists of that portion of our country have already enough to do to contend with the grasshopper scourge, without having to guard their crops against a plague only less formidable and imminent. Should the noxious birds become as numerous and as widely diffused in the West as they are already in the thickly settled portions of the United States, they would there prove even more destructive to the crops than they are known to be in the East. For here they still live, for the most part, in cities, towns, and villages, where they derive their subsistence chiefly from street-garbage,

especially horse-manure ; but in the West, where such supplies are more limited, these granivorous birds would at once and continually prey upon the crops. I am not informed to what extent they may have multiplied already in some of the places, as at Salt Lake City, to which they have been transported, and where they have obtained a foothold ; but it may not be too late, if vigorous measures are taken at once, to stamp out the plague. The strongholds of the birds are few, comparatively speaking, and isolated to such a degree that the eradication of the birds from that part of the United States may not be now absolutely impracticable, as unfortunately seems to be the case in the East. The Great Plains offer a natural barrier to the westward progress of the birds from the Mississippi ; and if pains be taken to destroy the advance guard as fast as they move westward, the evils now suffered in the East may be long delayed or even avoided. In most parts of the West where the sparrows have appeared, it is believed that they have been imported, not that they reached these spots by spontaneous migration or natural dispersion. If this be the case, indeed, it may not be a matter of the greatest difficulty to destroy them, root and branch, in the comparatively few places in which they have already become naturalized. Should this be done, and laws be passed prohibiting the introduction of the birds into the Western States and Territories, immunity from invasion might be secured for a practically unlimited period. To bring this matter to the attention of the people in the West, and to urge that such measures be taken without further dangerous delay, is the object of the present paper.

This may seem an extreme course, to the few who still

look favourably upon the presence of the sparrow in America ; but such may be assured that it is no more than the exigencies of the case demand. Unless the sparrows can be made to devour grasshoppers there is absolutely no occasion for their naturalization in the West, not even the flimsy excuse for them that we sometimes hear made in the East. That they will not subsist upon grasshoppers to any extent, or upon potato-beetles, may be regarded as a foregone conclusion ; and in the absence of other sources of food-supply, they will infallibly fall upon the crops.

Though it must appear to all well-informed persons a work of supererogation to point out what mischief the sparrows have done, what worse evils are in prospect, and what thoroughly undesirable birds these are from every standpoint, yet the people of the West may not be fully apprised as yet of the actual state of the case. Their attention is therefore called to the present status of the sparrow in America, as fully exhibited in the following review of the situation.

For it occurs to me that the facts in the case can in no way be more forcibly presented or more clearly illustrated than by the simple and lucid method of setting forth, in sufficient detail, the controversy which the introduction of the sparrow into America has occasioned, and analyzing the mass of evidence we have accumulated. To such a record, moreover, attaches a degree of historical interest. Instead of expressing my own views, or of preparing statements which might be open even to an unfounded charge of prejudice, I have therefore thrown what I have to say into the form of a commentary on the record itself, leaving each one to form his own opinion on the subject.

The following record* forms a portion of a more elaborate article which I have in preparation upon the general subject. Though very incomplete—in fact, representing but a fragment of the literature which the sparrow question has occasioned—it is sufficient for present purposes. It is compiled from all available sources, without partiality or prejudice, and the commentary is written without fear, favour, or affection. It includes every article which I have seen, and a few others, the titles of which I have taken from Mr. T. G. Gentry's book. For some, I am indebted to the kindness of Prof. C. V. Riley. Articles in favour of, as well as those unfavourable to, the sparrow, have been collated with equal care; but those of the former character are so few and weak in comparison with those of the latter category that, if the contributions to the subject made by the eminent ornithologist, Dr. Thomas M. Brewer, be excepted, little remains on that side of the question. Additional titles of articles bearing upon the off-side of the controversy are therefore the special desiderata of this piece of bibliography; but any additions to the list or corrections of errors which may be detected will be very acceptable to the compiler.

* The 'record' to which Dr. Coues refers, forms seventeen closely printed large octavo pages, which sufficiently shows the great importance attached to the 'English Sparrow Question' in America. It is not, however, of sufficient interest to English readers to demand its reproduction. The following portion is a fair sample of the rest.

1867. PICKERING, C. [On the Introduction of the European House Sparrow into America, as threatening a Great Evil.] *Proc. Bost. Soc. Nat. Hist.* xi. 1867, pp. 157, 158.

It appears from the record herewith presented that the credit of being the first in this country to foresee and predict the evil to result from the introduction of sparrows into America belongs to Dr. Charles Pickering. This article may be regarded as the entering-wedge; and as such it is entitled to special consideration. It was not, however, until 1874 that the controversy was fairly opened, though in the mean time several American writers ventured to express their apprehensions, and to give warnings which passed unheeded. *Cf., e.g.,* BRUCE, *Amer. Nat.* vi. 1872, pp. 469, 470; COUES, *Key N. A. Birds*, 1872, p. 146.

1872. J. P. The English Sparrows [*Passer domesticus*]. *Country Gentleman*, Aug. 1, 1872.

That they are not efficient destroyers of insects, but that they do drive away native birds.

1874. BREWER, T. M. The European House Sparrow [*Passer domesticus*]. *Amer. Nat.* viii. No. 9, Sept. 1874, pp. 556, 557.

The opening of the controversy on the part of Dr. Brewer. 'I regret very much that a naturalist generally so well informed as Dr. Coues should aid in giving what my own observations compel me to believe to be an altogether wrong statement in regard to the house-sparrow, published in the July number of the *Naturalist*. . . . I submit that this is too important a question to be thus dismissed, especially by a gentleman like Dr. Coues, who has enjoyed no opportunity of knowing from his own observations whether the opinions he is so free to express are well founded or not. The statement of Mr. Gentry I entirely discredit.' Dr. Brewer's own observations and opinions follow.

1874. COUES, E. English Sparrows [*Passer domesticus*].
Amer. Nat. viii. No. 7, July, 1874, p. 436.

Having expressed, in the Key to North American Birds, p. 146 (1872), apprehensions that the sparrows would soon begin to interfere with the native species, Dr. Coues prints a statement from Mr. T. G. Gentry, verifying the anticipation. Says Mr. Gentry, referring to sparrows in Germantown, Pa.: 'They increase so rapidly, and are so pugnacious, that our smaller native birds are compelled to seek quarters elsewhere.' Dr. Coues continues: 'I did not expect the bad news quite so soon. Probably it will not be long before we hear the same complaints from other places. . . . There is no occasion for them (the sparrows) in this country: the good they do in destroying certain insects has been overrated. I foresee the time when it will be deemed advisable to take measures to get rid of the birds, or at least to check their increase.'

1874. COUES, E. The Sparrow [*Passer domesticus*]
 War. *Amer. Sportsm.* v. Nov. 21, 1874, p. 113.

'Several articles which have lately appeared in *The American Naturalist* and *American Sportsman*, from my pen and others, indicate that a pretty lively contest is likely to result. Much as I dislike controversy . . . I am just as willing to stand corrected as to prove anybody else wrong. The personal aspect of the question is a matter of the utmost indifference to me. . . . It is a more important question than it looks at first sight, and it is daily growing more so. Now let us accumulate evidence.'

1874. GENTRY, T. G. English Sparrows [*Passer domesticus*]. *Amer. Nat.* viii, No. 11, Nov. 1874, pp. 667-672.

Attesting the molestation of various American native birds by the sparrows, in amplification of his previous testimony to the same effect (*tom. cit.* p. 436); and denouncing as groundless the charges of misrepresentation brought against E. Coues and himself by T. M. Brewer (*tom. cit.* p. 556). The article is notable among those opening the controversy.

1874. GOULD, SAMUEL. English Sparrows [*Passer domesticus*]. *Amer. Nat.* viii. No. 11, Nov. 1874, pp. 692, 693.

Statement of the quantity of kitchen vegetables he was able to raise by using netting to prevent the sparrows from doing serious damage.

1874. GREGORY, J. H. Are European Sparrows [*Passer domesticus*] to be a Pest? *Moore's Rural New Yorker*, Oct. 10, 1874.

Affirmative: . . . 'that to reduce the number of caterpillars on a few thousand shade trees in deference to the weak nerves of over-nice individuals, we had opened a perfect Pandora's box, and let fly through the land destruction to the grain crops of the country to the value of millions annually.'

1874. LAMBERTON, A. B. The Sparrow [*Passer domesticus*] Controversy. *Amer. Sportsm.* v. Dec. 26, 1874, p. 200.

'I am fearful lest they do much towards driving away from our cities our best and sweetest song-birds. . . . It is high time for us to declare war against the foreign intruders.'

1874. RIDGWAY, R. A Contribution to the 'Sparrow [*Passer domesticus*] War.' *Amer. Sportsm.* v. Dec. 12, 1874, p. 161.

Pugnacity of the species, which is stated to have driven away the song sparrows from the Smithsonian Grounds in Washington. Witness of the attack of sparrows upon a snowbird.

1874. WILLARD, S. L. English Sparrows [*Passer domesticus*] and American Birds. *Moore's Rural New Yorker*, Apr. 25, 1874.

Statement that the birds are not as beneficial as they had been supposed to be, and their injurious reaction on native species.

1874. WILSON, E. R. Sparrows [*Passer domesticus*] rule the roost. *Amer. Sportsm.* v. Nov. 7, 1874, p. 91.

Disappearance of swallows and other birds with the advent of sparrows at Syracuse, N. Y.

1875. ANON. Sparrows [*Passer domesticus*] and Fruit Growers. *Amer. Agric.* Feb. 1875.

'That they destroy insects there is no doubt, but their work is not entirely beneficent; and melancholy accounts have been told of loss to the farmers by the havoc sparrows make in their grain.'

1875. BENDIRE, C. The Sparrow [*Passer domesticus*]. *Amer. Sportsm.* v. Jan. 9, 1875, p. 227.

Results of two years' observations of sparrows at St. Louis, Mo. No molestation of native birds observed. 'I must say, however, that in my opinion the usefulness of the English sparrows as insect-destroying birds is greatly overrated, and that we have many native species who destroy more noxious insects in a single day than a sparrow will in a week.'

1875. HAMPTON, C. J. English Sparrows [*Passer domesticus*] and the Canker Worms. *Moore's Rural New Yorker*, Jan. 23, 1875.

'English sparrows have had no agency in the disappearance of the worms' in Seneca County, N. Y. Editor continues: 'At the very time of their introduction into New York City and Brooklyn, a small ichneumon fly had already lessened very materially the number of spanworms, which were so disagreeably abundant in these cities, and it is very probable that the insects would have disappeared without the aid of the birds.'

1875. STERLING, E. Sparrows [*Passer domesticus*]. *Amer. Sportsm.* Jan. 23, 1875.

'They are a most pestiferous bird, driving all our native birds away, and at the same time destroying no insect life that preys upon our roadside trees.'

1875. STERLING, E. Those Sparrows [*Passer domesticus*]. *Rod and Gun*, vi. July 31, 1875, p. 266.

Repeated spoliation of nests of robins and orioles by the sparrows.

1875. W. B. C. Sparrows [*Passer domesticus*]. *Rod and Gun*, vi. June 19, 1875, p. 187.

Ejectment of different birds from their homes by the sparrows.

1876. MUENCH, F. The European House Sparrow [*Passer domesticus*]. *Rural World*, Apr. 19, 1876; reprinted N. Y. *Weekly Sun*, May 24, 1876.

'Nothing eatable, if possibly accessible, is secure from his attack—garden products, as well as all kinds of fruit, cherries and grapes in particular; wheat-fields . . . what barns, stables, and houses contain, if not carefully guarded—will become his prey.'

1877. P[URDIE], H. A. The Sparrow [*Passer domesticus*] in Boston. *Boston Daily Advertiser*, July 30, 1877.

A clear refutation of the assertions of T. M. Brewer and others, that the sparrow had been effective in destroying the *Orgyia leucostigma*, the trees being devastated by these insects, and the city forester having men at work still. 'All over the boles of the elms, maples, lindens, and other trees, might be seen crawling the larvæ . . . the completed cocoons were to be seen by thousands . . . not one is molested by *passer domesticus*.' The extracts from one of Dr. Brewer's articles, printed in the body of this paper, read very curiously in the face of the facts adduced. The writer had every opportunity for accurate observation.

1877. SAMUELS, E. A. Butcher Birds and Sparrows [Passer domesticus]. *Boston Transcript*, Feb. 3, 1877.

Denunciatory of the Sparrow, and advocating the butcher birds as destroyers of the nuisance. 'The bird will unquestionably prove as great a nuisance in this country as it has been found in Europe, and I doubt not a bounty will at some time be offered for its head. . . . The English sparrow has driven away all our own pretty and interesting and musical birds, and I almost wish for a visitation from some immense host of "butcher-birds" to finish them.'

1878. COUES, E. The Sparrow [Passer domesticus] Pest. *The Country*, Jan. 19, 1878.

Citing the observations of Dr. SACC, *Rev. et Mag. de Zool.* xii. p. 94, in evidence of the extraordinary fecundity of these birds. A female laid 35 eggs in as many days. (!)

1878. GENTRY, T. G. The House Sparrow at Home and Abroad, with some concluding remarks upon its usefulness, and copious references to the literature of the subject. By Thomas G. Gentry, Philadelphia, 1878. With coloured frontispiece of *Passer domesticus*.

One of the good results of the controversy has been the appearance of this work, in which the whole subject is set forth at full length, in clear light, with every regard for impartiality. Mr. Gentry's careful and critical survey of the situation renders his presentation of the case conclusive. All the charges that have been brought against the sparrow are discussed and substantiated, while due weight is given to the other side of the question. It is a very useful book, which should be widely circulated.



From AVIFAUNA COLUMBIANA,

By DR. ELLIOTT COUES, and D. W.
PRENTISS.

A VERY disturbing element has been introduced since our list originally appeared ; namely, the European Sparrow. Though nearly every one—even among those who were instrumental in importing the pest—admits that we made a great blunder, all are slow to be persuaded of the enormity of the mischief these little creatures will work in the course of time. With this, however, we have here nothing to do ; we only bring up the subject in connection with the decrease in the number and variety of our native singing-birds in the city itself. This is a fact which probably every one has noticed, and which few pretend to deny any longer. It is not due to the building up of the city and the increase in the population, as some have supposed. The city is parked and preserved nearly throughout, and full of shade and ornamental trees. The actual number of trees is vastly greater than it was in the cow-pasture days of the *ante bellum* epoch ; and there is no reason why those birds which ordinarily inhabit cities should not be at least as numerous as ever, or rather more so, were they not driven away by the sparrow. It would perhaps be more accurate to say, were they not crowded and elbowed out of the way ; the impress made by the sturdy little foreign vulgarians upon the native population being effected rather by their numbers, their persistency, turbulence, and noisiness, than by their pugnacity or aggressiveness ; though downright acts of hostility may be continually witnessed. In fine, there is not food and room enough for many other birds where sparrows are numerous.



This nuisance was introduced some years after our list appeared ; and so far from there being any prospect of its abatement, it has increased each year. There is said to be a remedy for every ill under the sun, but none has been found as yet for this one, notwithstanding the ceaseless complaints and protests that we hear from all sides. The rowdy little gamin squeaks and fights and does worse all through the city, to the annoyance and disgust of nearly all persons. In the aggregate the suffering he will entail upon invalids and those prostrated by sickness is immeasurable. Washington harbours and encourages a select assortment of noise-nuisances : the black newspaper imps who screech every one deaf on Sunday morning ; the fresh-fish fiends, the berry brutes, the soap-fat scoundrels, and the o' clo' devils ; the milk mercenaries with their detonating gongs : but all these have their exits as well their entrances ; the sparrows alone are tireless, ubiquitous, semipiternal. They begin just about the time one of the authors of this treatise generally goes to bed and tries to go to sleep—towards daybreak—and keep it up till their voices swell in a diapason of horror with those of the other unspeakable wretches above alluded to. They breed during the greater part of the year—breed at a year old—keep breeding—breed numberlessly. In place of many sweet songsters which used to grace and enliven our streets, we have these animated manure machines, as almost every house-owner in the city knows to his cost. Whatever may be said to the contrary notwithstanding, the sparrows, besides persecuting the human species, do molest, harass, drive off, and otherwise maltreat and forcibly evict and attempt to destroy various kinds of native birds, which are thereby deprived of certain inalienable rights to life,

liberty, and the pursuit of happiness after their own fashion. To offset all this what have we? Nothing, absolutely nothing.

From KEY TO NORTH AMERICAN BIRDS,

BY DR. ELLIOTT COUES.

THE English sparrow was imported about fifteen [twenty] years ago. During a craze which even affected some Ornithologists, making people fancy that a granivorous conirostral bird would rid us of insect-pests, this sturdy and invincible little bird has overrun the whole country, and proved a nuisance without a redeeming quality. Well-informed persons denounced the bird without avail during the years when it might have been abated; but further protest is futile, for the sparrows have it all their own way, and can afford to laugh at legislature, like rats, mice, cockroaches and other parasites of the human race which we have imported. This species, of all birds, naturally attaches itself more closely to man, and easily modifies its habits to suit such artificial surroundings; this ready yielding to conditions of environment, and profiting by them, makes it one of the creatures best fitted to survive in the struggle for existence under whatever conditions man may afford or enforce; hence it wins in every competition with native birds, and in this country has as yet developed no counteractive influence to restore a disturbed balance of forces, nor any check whatever upon its limitless increase. Its habits need not be noted, as they are already better known to everyone than any native bird whatever.

A RUFFIAN IN FEATHERS.

By OLIVE THORNE MILLER.

Abbreviated from the 'Atlantic Monthly.'

THE harshest cries of our native American birds, if not always musical in themselves, seem at least to accord in some way with sounds of nature. The house-sparrow alone is entirely discordant—the one bird without a pleasing note, whose very love-song is an unmusical squeak. Nor is his appearance more interesting than his voice, and on looking into his manners and customs we discover most unlovely characteristics.

One cannot help watching bird-life, however ignoble, which goes on within sight. Sparrows have long been my neighbours, and I have observed many phases of their life—combats, brawls, forcible divorce, and persecution of the unfortunate. A day or two ago I saw a murder 'most foul,' and now, while indignation stirs my blood, I will chronicle the ruffian's monstrous deeds.

Near my window is a Norway spruce, which this spring I regretted to see selected by a pair of sparrows for one of their clumsy, straggling nests, to which they brought rubbish of all sorts and colours, from hay of the street to carpet ravellings from the spring house-cleaning, till the tree was greatly disfigured. I do not know how many broods have been raised there, but on the 6th of July I

was attracted by cries of infant distress, mingled with harsh parental scolding. On looking out I saw great excitement in the spruce : the mother hopping about with an air of anxiety ; the father scolding his loudest, and making constant raids to drive away intrusive neighbours who collected in the next tree. An opera-glass brought the scene near, and I saw at once the cause of the trouble. A nestling had entangled one foot in the edge of the nest, and hung head downwards, calling loudly for help. The mother was evidently trying to coax him to 'make an effort,' while the stern father was uttering dire threats if he did not conduct himself in a more becoming manner. The poor sparrowling struggled bravely, but every attempt ended in failure, and the little fluffy body drooped more wearily after each trial.

A life is a life, if it is but a sparrow's, and so greatly were my sympathies aroused that I would have despatched human help to the scene of the accident ; but the tree was tall and slender, and the only available climber was a young gentleman who would laugh to scorn the demand. Nothing could be done but watch the movements of the birds.

The mother perched on a lower branch and stood quiet, evidently aware that her lord and master would settle the matter. That choleric individual made one or two attempts to aid the youngster, seizing him by his wide-open mouth, and pulling so violently that I thought he would dismember him. All was of no avail. Neighbours crowded nearer ; the tree was loaded with interested spectators, and the father grew more and more irritated, till at last he seemed suddenly seized with an irresistible frenzy. With the harshest 'chur-r-r' of which he was capable, he pounced upon that unfortunate infant, seiz-

ing him by the throat, burying his bill in his breast, shaking him as a dog would shake a rat, and in less than thirty seconds dragged him from his hold, and dropped him to the ground—a dead bird.

I was horrified, and so were the other spectators. Once during the occupation the mother had tried to interfere, and was told unmistakably to ‘mind her own business.’ Several times the male audience attempted to take part—whether for or against the victim I could only guess—but were as summarily disposed of. That little incarnate fury was the tyrant of the moment, and worked his own wicked will to the end.

As soon as the tragedy ended every bird disappeared, and the tree was completely deserted as though accursed. The murderer alone did not leave the neighbourhood, but strutted back and forth, on an elm which overlooked the scene of his crime; fluttering his wings, calling loud defiance to all the world, in the greatest excitement for hours. Were there no other youngsters in the nest? Were they left to starve? And where was the mother? As to the first query, I could not be sure. Once during the fray I thought I saw something drop from the nest, and I was obliged to conclude that if there had been another it had fallen victim to a passing cat.

In an hour or two the mother came back, as if to put her house in order and resume her duties, but her spouse had other designs. Whether he resented her interference with his lordly will, or whether the late unpleasantness was attributed to her because of defective training or untidy house-building—whatever the cause, the fact was patent that he had made up his mind to divorce the partner of his sorrows. She appreciated his intention, as was evident from the cautious way in which she ap-

proached, looking around for him, and stealing to the nest, as it were, but was resolved to make every effort to induce in him a better spirit and mollify his rage. She did not seem greatly grieved, nor in the least angry. She never opened her mouth to answer back the torrent of reproaches with which he greeted her, but instantly retired before his fierce onslaught. Not once did that fiery spirit go to the ground for food, or lose sight of his nest. Most of the time he perched on a branch of the elm, where he could overlook the spruce and be ready for intruders ; but occasionally he went by his usual alighting-places to the empty home, clearing out beakfuls of small downy feathers, and apparently setting his house in order.

But the strange little bird-drama, suggestive, alas ! of some phases of human passion, was not yet concluded. Many times during the day the divorced spouse came near, as if to survey her late home, and see if her lord was in a more amiable mood ; but she found him utterly remorseless, ever on guard to repel all attempts to 'make up.' When at last, after the long hours of night had calmed his savage temper, his mood did change, it was not to her that he turned for sympathy. He would not forgive, but he had no notion of remaining a pining widower. Before evening the next day he went a-wooing, and there appeared upon the spruce-tree, with the evident purpose of examining the home and assuming possession, a dainty young bird. It had taken that disreputable sparrow less than thirty-six hours to kill his baby, divorce his wife, and woo and bring home a bride !

It may be a matter of surprise that one can distinguish between birds, but it is not at all difficult when their habits are watched closely. I knew the new wife from the

old one in two ways : first, the old one, after the labours of bringing up a brood or two, was worn and ragged, while the new-comer was fresh as a daisy, and fluffy and young-looking as a nestling ; second, she approached the nest in a different way. It is true of sparrows, however it may be with other birds, that each one has his special alighting-places, a certain twig where he first settles, and certain others on which, as a flight of steps, he invariably proceeds to his nest. The mother of the dead infant always came to the home from the right side, and her grim tyrant does so still, but the bride selected a convenient series of twigs on the left side.

It is now four or five days since the crime was committed, and although the new spouse is perfectly at home and settled, peace, even to the extent that a sparrow enjoys it, is still a stranger to the spruce-tree nest. I think it is haunted by the discarded mate. Certainly a sparrow, that I have no doubt is she, comes to the neighbourhood, and scolds the meek-looking bride and her spouse in most savage fashion. No one resents her performance; and after a moment she goes away.

The sparrow is an autocrat, especially addicted to divorcing his partner upon the smallest pretext. I have elsewhere chronicled two small dramas in sparrow life which I watched from beginning to end. The actors in the first were a pair living in a hole in a maple-tree before my window. For some undiscoverable reason the graceless head of the household decided to make a change in his domestic arrangements, and to begin by divorce. In that case the female had the advantage, since the home was not an open nest, but a castle. She had possession, and kept it for two days, in spite of violent vituperation and the most threatening manner. In this case, also, I

observed that she never 'talked back,' indulged in unseemly scolding, or assumed the offensive in any way. She appeared indifferent to his opinions, but enough attached to her home to endure his annoyances for two days before she tired of the controversy. When at last she accepted her fate and departed, I saw him bring home the bride, as coquettish a young thing as can be imagined, coax her by many wiles to examine the snug house, follow her about, and finally induce her to take up her residence with him.

The other case was of trouble on the other side. A cock sparrow lost one leg, and his mate, who had nestlings to feed, attempted to divorce him. Several birds appeared upon the scene, evidently aspirants for the soon-to-be-vacant place. But the little fellow, though evidently suffering so greatly that several times he appeared to be dying, never failed to revive and attack with fury every pretender, and after a day or two of this conflict was able to resume his duties as assistant provider for the little ones, when his spouse amiably 'kissed and made up.' All through the trouble she never displayed temper. She refused him admission into the honeysuckle vine, where the nest was ; but she would come out and alight near him on the window-sill, talk to him calmly, reproach him, evidently, reminding him of the babies to feed, and he not able to help. To these remarks he made little reply.

As I said, the sparrow is a domestic tyrant, brooking no opposition. I have never observed a case in which the hen had her own way. He is so great a bully, so self-willed and violent, that whatever the cause of disagreement, he holds out with dogged obstinacy till he gets his will. In one case there was difference of opinion as to the site for a nest ; he wishing to occupy an empty cottage

of man's providing, while she, with finer instinct, had decided upon a charming crotch in an evergreen tree. At first she opposed him strongly, scattering the material he brought, throwing the choicest bits to the winds, while he stormed and scolded, and—brought more. In the intervals between thwarting his plans, she would accumulate materials in the chosen tree. He scorned to touch them; he simply ignored her designs, and proceeded with obstinacy almost sublime to bring, and bring, and bring, till she was worn out, gave up, and accepted the cottage at last.

One of the most familiar habits of this graceless bird is his delight in a mob. No sooner does anything occur to disturb the even tenor of sparrow life, whether a domestic skirmish, the first outing of a young family, or some danger to a nest, than a crowd collects, not only as interested spectators, but quite ready and willing to take a hand in any sport or crime that is going; not only a hand but a voice as well. Loud cries always announce when a rabble is at work. Whether, as is declared by some observers, they drive away our native birds by this means I am not sure. I have seen them annoy the cat-bird, the robin, and the Baltimore oriole, but in each case they were put to flight by the native bird; though no doubt the experience is sufficiently disagreeable to induce either of these birds to select a more retired neighbourhood for nest-building. I once noticed the same tactics successfully applied to a cat which climbed up among the nests.

Next to the sparrow's mobbing propensity is his impudence. Not only will he insist on sharing the food of chickens and domestic animals, but he is a common guest at the table of the great bald eagles in the parks, and does not disdain the crumbs that fall from the repast of

the polar bear, one touch of whose paw would flatten him like a wafer.

Perhaps the most saucy thing reported of a sparrow was witnessed in Brooklyn by a well-known artist. He was watching a robin* hard at work on the lawn, gathering food for his family, when he noticed a sparrow, who also seemed interested in the operation. The sparrow looked on, evidently with growing excitement, while one bit after another was uncovered, till at last a particularly large and attractive grub was brought to light. This was too much for sparrow philosophy. He made one dash, snatched the tempting morsel from the very bill of the robin, and disappeared before the astounded bird recovered from his surprise.

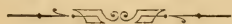
* The American robin is a rather large bird, a thrush indeed, with red-breast (*Turdus Migratorius*).

*Selection of Works, from the Stock of
William Wesley and Son,
28 Essex Street, Strand, London,*

IN

Natural History & Science.

* * * The works are in many cases single copies in second-hand condition, but in good order.



BOTANY.

BEHRENS (Dr. J. W.) The Microscope in Botany. Complete Guide to the Use of the Microscope in Botanical Research, translated and edited by Rev. A. B. Hervey, A.M., assisted by R. H. Ward, M.D., F.R.M.S., 13 plates and 152 engravings, pp. 430, 8vo, *cloth*, Boston, U.S., 1885 (pub. £1 5s.), £1.

BENTHAM (G., F.R.S.) Handbook of the British Flora : Flowering Plants and Ferns indigenous to, or naturalized in, the British Isles, 4th edition ; also, Illustrations of the British Flora, drawn by W. H. Fitch and W. G. Smith, 1,306 engravings, with index, 2 vols., crown 8vo, *cloth*, 1878-1880, £1 ; also the FIRST EDITION, in larger type, 2 vols., 8vo, *cloth*, 1865, £3 3s.

GERARDE (J.) The Herball, or Generall Historie of Plantes, by Thomas Johnson, Citizen and Apothecarye of London, 1630 pp., with several Beautiful Figures of Plants on nearly every page, the Herball (text, illustrations, and indexes) complete, and in good condition, folio, *calfs*, 1633, £4 10s.

This copy contains the finely engraved title-page, and is in exceptionally good condition.

GRAY (Asa, LL.D., *Professor of Botany in Harvard University*) Synoptical Florā of North America, Vol. I., Part II., Caprifoliaceæ—Compositæ, 474 pp., royal 8vo, *cloth*, 1884, £1 5s.

GRAY (Asa) Synoptical Flora of North America, Vol. II. Part I., Gamopetalæ after Compositæ, 402 pp., royal 8vo, *cloth*, 1878, £1 5s.

HOOKE (Sir W. J.) Species Filicum ; being Descriptions of the known Ferns, with 304 plates, 5 vols., 8vo, *cloth*, 1846-64 (pub. £6 18s.), £2 17s. 6d.

LINDSAY (W. L., M.D.) British LICHENS, an Account of their Structure, Reproduction, Uses, Distribution, and Classification, with a Bibliography, and 21 coloured plates, square 16mo, *cloth*, scarce, 1856, 18s.

LODDIGES (C.) Botanical Cabinet, 2,000 Fine Coloured Plates of Plants from all Countries, with a short account of each, Directions for Management, etc., 20 vols., 4to, *boards*, large paper and uncut, 1818-33, scarce, £20.

NYMAN (C. F.) Conspectus Floræ Europææ, seu enumeratio methodica Plantarum Phanerogamarum Europæ Indigenarum, 4 parts, and Supplement I., 8vo, *half calf*, *gilt*, and supp. in *cloth*, Orebro Sueciæ, 1878-84, £1 17s. 6d., or in 5 parts, *sewed*, £1 15s.

ORCHIDS, the Royal Family of Plants, with Illustrations from Nature, by Harriet Stewart Miner, 24 full-page coloured plates, folio, *cloth*, *gilt edges*, 1885, £2 2s.

PARKINSON (John) Paradisi in Sole Paradisus Terrestris, finely engraved title of the 'Garden of Eden,' numerous full-page engravings of plants, 612 pp. and index, folio, *original calf*, 1629, rare, £5 5s.

PARKINSON (John) *Theatrum Botanicum*: the Theater of Plants, or an HERBALL of a large extent, 1,755 pp., with fine engravings of plants on nearly every page, indexes and engraved title-page, folio, *old calf*, 1640, scarce, £5 5s.

SACHS (Julius) *Text-Book of Botany, Morphological and Physiological*, edited, with an Appendix, by S. H. Vines, F.L.S., numerous engravings, 2nd edition, royal 8vo, *half morocco*, Oxford, 1882, £1 6s. 6d.

SEBOTH (Joseph) *Alpine Plants: the Text* by F. Graf; with an Introduction on the Cultivation of Alpine Plants, by J. Petrasch; edited by A. W. Bennett, F.L.S. Complete set, 400 coloured plates, 4 vols., small 4to, *half morocco*, 1884 (pub. £5), £4.

SELBY (P. J., F.L.S.) *History of British Forest-Trees*, Indigenous and Introduced, 200 fine engravings, 8vo, *cloth*, scarce, 1842, £2.

CONCHOLOGY, ETC.

ALDER (Joshua) and **ALBANY HANCOCK**, *Mono-graph of the British Nudibranchiate Mollusca*, with 82 plates, most of them coloured, complete in 7 parts, folio, *boards*, Ray Society, 1845-55 (pub. £9 12s.), £4 4s.

ALLMAN (G. J.) *Monograph of the Fresh Water Polyzoa*, including all the known Species, both British and Foreign, with 10 coloured plates, folio, *boards*, Ray Society, 1856, £3 3s.

CARPENTER (W. B.), assisted by **W. K. PARKER** and **T. RUPERT JONES**, *Introduction to the Study of FORAMINIFERA*, with 19 fine plates, folio, *boards*, Ray Society, 1862, £3.

ELLIS (John, F.R.S.) Natural History of the CORALLINES, and other Marine Productions of the like Kind, commonly found on the Coasts of Great Britain and Ireland, to which is added the Description of a large Marine Polype taken near the North Pole, by the whale fishers, with frontispiece and 39 plates, 4to, *half-bound*, 1755, 15s.

ELLIS (John) Natural History of many Curious and Uncommon ZOOPHYTES, collected from various parts of the Globe, by the late John Ellis, Esq., F.R.S., systematically arranged and described by the late Daniel Solander, M.D., F.R.S., with 63 plates, very finely and accurately engraved, 4to, *boards*, a fine uncut copy, 1786, £1 1s.

GRAY (Maria Emma) Figures of MOLLUSCOUS Animals selected from various authors, about 400 fine plates and portrait of Mrs. Gray, 5 vols., 8vo, *cloth*, 1842-57, £2 10s.

JEFFREYS (J. G.) British Conchology ; an Account of the Mollusca which now inhabit the British Isles and surrounding Seas, with coloured figures of all the species on 147 plates, 5 vols., post 8vo, *cloth, uncut*, 1862-69 (pub. £5 5s.), £4 10s. ; with plain plates, £3 10s.

ENTOMOLOGY.

BLACKWALL (John) History of the SPIDERS of Great Britain, with 29 fine coloured plates, 2 vols., folio, *boards*, Ray Society, 1861-64, £3 15s.

COX (Herbert E., M.E.S.) A Handbook of the Coleoptera or Beetles of Great Britain and Ireland, 900 pp., 2 vols., 8vo, *cloth, uncut*, 1874, 17s. 6d.

- DONOVAN (E.) Natural History of the INSECTS of India, new edition, by J. O. Westwood, with 58 finely-engraved plates, containing upwards of 220 figures of natural size, beautifully coloured, with the Plants on which they feed, 4to, *new half morocco*, 1842, £3 3s.
- DOUGLAS (J. W.) and J. SCOTT, British Hemiptera-Heteroptera, illustrated by 21 plates, thick 8vo, *cloth*, scarce, 1865 (pub. £1 11s. 6d.), £1 1s.
- DRURY (Dru) Illustrations of Exotic Entomology, containing upwards of 650 coloured Figures and Descriptions of FOREIGN INSECTS, a new edition, by J. O. Westwood, 3 vols. of text in one vol., and the 3 vols. of fine COLOURED PLATES in one vol., together 2 vols., 4to, *half bound*, 1837 (pub. £15 15s.), £4 17s. 6d.
- ENTOMOLOGIST'S ANNUALS, edited by H. T. Stainton, complete set, with coloured and plain plates, containing numerous figures, 20 vols. bound in 10 vols., 12mo, *new half calf*, 1855-74, £2 12s. 6d.
- KIRBY (W. F., *Assistant in Zoological Department, British Museum*) Elementary Text-book of Entomology, with 87 plates, containing over 650 figures, 8vo, *cloth*, 1885, 12s. 6d.
- KIRBY (W. F.) British Butterflies, Moths and Beetles, with 132 figures, crown 8vo, *cloth*, 1s.
- LANG (H. C., F.L.S.) Rhopalocera Europæ Descripta et Delineata (The Butterflies of Europe Described and Figured). With 82 plates, containing 800 coloured figures, 2 vols., royal 8vo, *cloth*, 1885, £3 5s.
- PACKARD (A. S., M.D.) Guide to the Study of INSECTS, being a Popular Introduction to the Study of Entomology, and a Treatise on Injurious and Beneficial Insects, with De-

scriptions and Accounts of the Habits of Insects, their Transformations, Development, and Classification, 8th edition, with 15 plates and 670 engravings, royal 8vo, *cloth*, New York, 1883, £1 5s.

RYE (E. C.) British Beetles : an Introduction to the Study of our Indigenous Coleoptera, 16 coloured steel plates of species, and 11 wood engravings, crown 8vo, *cloth*, 1866, 8s. 6d.

SPRY (W.) and W. E. SHUCKARD, British Coleoptera Delineated, with 94 plates, figures of all the Genera of British Beetles, 8vo, *cloth*, 1840, scarce, £1 1s.

STAVELEY (E. F.) British Insects : a Familiar Description of the Form, Structure, Habits, and Transformations of Insects, 16 coloured plates and numerous wood engravings, crown 8vo, *cloth*, 1871, 10s. 6d.

STAVELEY (E. F.) British Spiders : an Introduction to the Study of the Araneidæ found in Great Britain and Ireland, 16 plates, containing coloured figures of nearly 100 species, crown 8vo, *cloth*, 1866, 8s. 6d.

WESTWOOD (J. O.) Introduction to the Modern Classification of Insects, founded on the Natural Habits and Corresponding Organization of the different Families, coloured plate and 130 wood engravings, 2 vols., 8vo, *cloth*, 1839-40; £3 15s.

WOOD (W., F.R.S.) Index Entomologicus, or a Complete Illustrated Catalogue, consisting of 1,944 coloured figures of the Lepidopterous Insects of Great Britain, 1st edition, very scarce, large paper, 8vo, *half-calf*, 1839, £5 5s.

The 1,944 figures are exquisitely coloured, which cannot be said of the subsequent editions of the work.

FISHES.

BIBLIOTHECA PISCATORIA : a Catalogue of Books on Angling, the Fisheries and Fish-Culture, with Bibliographical Notes, and an Appendix of Citations touching on Angling and Fishing from old English Authors, by Thos. Westwood and Thos. Satchell, 432 pp., 8vo, *cloth*, 1883, 12s. 6d.

BLOCH (M. E.) Histoire Naturelle des Poissons, avec des Figures dessinées d'après Nature par Bloch. Par René-Richard Castel, with 152 fine coloured plates, 10 vols. in 5, 12mo, *half-calf*, Paris, an ix., £1 1s.

DAY (F.) The Fishes of Great Britain and Ireland : a Natural History of such as are known to Inhabit the Seas and Fresh Waters of the British Isles, their Economic Uses, Modes of Capture, etc., and an introduction upon Fishes generally, 179 plates, 2 vols., imperial 8vo, *cloth*, 1885 (pub. £5 15s.), £4 18s.

DAY (Francis) FISHES of India, being a Natural History of the Fishes known to Inhabit the Seas and Fresh Waters of India, Burmah, and Ceylon, with Descriptions of the Sub-classes, Orders, Families, Genera, and Species, 198 fine plates and 886 figures, 2 vols., imperial quarto, *half morocco*, 1876-78 (issued to Subscribers, £12 12s.), £8 17s. 6d.

GOODE (Prof. G. B., United States Commissioner to the Fisheries Exhibition, London, 1883) GAME FISHES OF THE UNITED STATES : a series of 20 magnificent paintings of Fishes and Scenery, by S. A. Kilbourne, with text by G. Brown Goode, Curator of the United States National Museum, and of the United States Fishery Commission ; 10 parts, size 28 by 22 inches, 1879, £10 10s.

YARRELL (W.) History of BRITISH FISHES. *Third Edition*, with Figures and Descriptions of the additional Species by Sir John Richardson, C.B., with Memoir, Portrait, and 522 engravings of fishes, 2 vols., 8vo, *half calf*, 1859 (pub. £3 3s.), £2 2s.

In fine condition. The former owner has carefully ruled lines under some important paragraphs.

MAMMALIA AND GENERAL ZOOLOGY.

COBBOLD (T. Spencer, M.D., F.R.S.) ENTOZOA: Introduction to the Study of Helminthology, more particularly the Internal Parasites of Man, also supplement, 21 coloured plates by the Author and G. Busk, imperial 8vo, *cloth*, 1864-69, scarce, £1 7s. 6d.

CLAUS (Dr. C.) Text-book of Zoology, translated and edited by Adam Sedgwick, M.A., and F. G. Heathcote, B.A., with 1,400 engravings, 2 vols., 8vo, *cloth*, 1884-85, £1 11s. 6d.

GARROD (A. H.) Collected Scientific Papers (on the Anatomy of Mammals and Birds), by W. A. Forbes, portrait and 33 plates, some coloured, 537 pp., royal 8vo, 1881, £2 2s.

On the Kangaroo, *Halmaturus luctuosus*, and its affinities.—Notes on the Manatee.—Anatomy of the Passerine Birds.—Anatomy of the Musk-Deer.—Anatomy of the Chinese Water-Birds.—On the Brain of the Hippopotamus, and many other Monographs.

JARDINE'S Naturalist's Library, a complete set, with 1,280 coloured plates, portraits of naturalists and vignettes, 40 vols., 12mo, *cloth*, Edinburgh, 1833-43, £7.

This is a genuine original copy, has the plates most carefully coloured by hand, and, in this respect, is far superior to any of the recent issues, which exhibit great inferiority in colouring. Comprises Mammalia 13 vols, Ornithology 14 vols, Entomology 7 vols, Ichthyology 6 vols.

LOUDON (J. C.) Magazine of Natural History and Journal of Zoology, Botany, Mineralogy, Geology, and Meteorology, numerous engravings, 9 vols., 8vo, *half morocco, gilt*, 1829-39, £2 12s. 6d.

STANDARD NATURAL HISTORY, to be completed in six volumes, imperial 8vo, edited by J. S. Kingsley.

Vol. I., **LOWER INVERTEBRATES**: Protozoa, Pori-ferata, Cœlenterata, Echinodermata, Vermes, Mollus-coidæ, Mollusca, illustrated by 501 wood engravings and 22 full-page plates, imperial 8vo, *extra cloth*, Boston, 1885, £1 10s.

Vol. II., **CRUSTACEA and INSECTS**: Crustacea—Cirri-pedia, Entomostraca, Podophthalmia, Edriophthalmia; Insects—Malacopoda, Arachnida, Myriapoda, Hexapoda (Thysanura, Neuroptera, Orthoptera, Hemiptera, Coleop-tera, Diptera, Lepidoptera, Hymenoptera, etc.), illustrated by 662 wood engravings and 20 full-page plates, imperial 8vo, *extra cloth*, Boston, 1884, £1 10s.

Vol. V., **MAMMALS**: Mammalia—Introduction; Mono-tremes and Marsupials, by R. Ramsay Wright; Edentates, by Theodore Gill; Rodentia, by Elliot Coues; Insect-ivora, by T. Gill; Bats, by T. Gill; Whales, by W. N. Lockington; Manatees, by J. S. Kingsley; Elephants, by G. Macloskie; Hyrax, by Kingsley; Toxodontia, by W. B. Scott; Ungulates, by R. Ramsay Wright; Carni-vores, by W. N. Lockington; Primates, by R. Ramsay Wright; illustrated by 244 wood engravings and 42 full-page plates, imperial 8vo, *extra cloth*, Boston, 1884, £1 10s.

The volumes are not sold separately.

THOMPSON (William) The Natural History of Ireland: BIRDS, 3 vols.; Mammalia, Reptilês, Fishes, and Inverte-brata, 1 vol., with portrait; together 4 vols., 8vo, *half morocco, gilt*, 1849-51-56, scarce, £4 10s.

'An excellent work, full of novelty and interest—might properly be called a Cyclopædia of the Habits of Birds, etc., in Ireland.'—*Athenæum*.

TRISTRAM (Rev. Canon H. B., D.D., F.R.S.) The Fauna and Flora of Western Palestine, with 19 fine plates (those of Mammalia and Ornithology coloured, and 17 figures of the Reptiles and Fishes), royal 4to, *cloth*, 1884, £3 3s.

WIED-NEUWIED (Maximilian, Prinz zu Wied) BEITRAEGE ZUR NATURGESCHICHTE VON BRASILIEN (MAMMALIA, AVES, REPTILIA, BATRACHIA), 4 vols., 8vo, *morocco*, Weimar, 1825-33, with 11 plates; also, ABBILDUNGEN ZUR NATURGESCHICHTE BRASILIENS, Weimar, 1822-31, 90 COLOURED plates, folio, *half-bound*, Presentation Copy to Col. C. H. Smith, with autograph of the author (pub. £11), £4 17s. 6d.

ORNITHOLOGY.

BAIRD (Prof. Spencer F.) JOHN CASSIN, and G. N. LAWRENCE—Report upon the BIRDS of the Explorations and Surveys for a Railroad Route from the Mississippi River to the Pacific Ocean, under the direction of the United States War Department, text, pp. lvi. and 1,005, Atlas of 37 fine coloured plates of Birds, with descriptions, 2 vols., royal quarto, *cloth*, Washington, U.S., 1858, £2 10s.

BULLER (Walter L.) Manual of the BIRDS of New Zealand, with 37 fine plates and engravings, royal 8vo, *cloth*, New Zealand, 1882, 12s. 6d.

COUES (Dr. Elliott, M.A., M.D., Ph.D.) KEY to NORTH AMERICAN BIRDS: concise account of every Species of Living and Fossil Bird, *Second Edition*, revised and re-written, with an Outline of the Structure and Classification of Birds. Numerous fine engravings, demy 8vo, *cloth*, 1884, £1 15s.

GAME BIRDS AND WATER-FOWL OF THE UNITED STATES, 20 fine coloured plates, equal to drawings, each measuring 22 by 28 inches, mounted on card-boards. List of plates: The American Snipe, the Green-winged Teal, the Woodcock, the Mallard Duck, the American Quail, the Black Duck, the Ruffed Grouse, the Blue-Bill Duck, the Prairie Chicken, the Red-head Duck, the Canada Grouse, the Wood Duck, the Californian Valley Quail, the Buffle-headed Duck, the Upland Plover, the Golden-eye Duck or Whistler, the Californian Mountain Quail, the Widgeon, the Canvas-back Duck, the Brant; one volume, atlas folio, *half-morocco, gilt edges*, 1878 (pub. £8), £4 17s. 6d.

HEWITSON (W. C.) Coloured Illustrations of the Eggs of British Birds, with descriptions of their nests and nidifications, 3rd edition, 2 vols., 8vo, *cloth*, 1856 (pub. £4 14s. 6d.), £4 4s.

MITCHELL (F. S.) The Birds of Lancashire, 242 pp., with map of the County, 2 coloured plates, 9 plain, and 3 vignettes by J. G. Keulemans, etc., crown 8vo, *cloth*, 1885, 7s. 6d.

The author is member of the British Ornithologist's Union. A work of great labour and research. Favouredly reviewed in *Nature*, July, 1885.

MORRIS (F. O.) History of British Birds, with 350 coloured plates, 8 vols., crown 8vo, *cloth*, 1862, £2 2s.

MORRIS (F. O.) Natural History of the Nests and Eggs of British Birds, new edition, enlarged, 233 coloured plates, 3 vols., super-royal 8vo, *cloth*, 1871 (pub. £3 3s.), £2.

RAMON DE LA SAGRA (D.) Historia Fisica Politica y Naturel de la Isla de Cuba, AVES por Mr. Alcides D'Orbigny, with 33 fine coloured plates of Birds and their Eggs, folio, *half-bound*, with the text in French, 8vo, Paris, 1839, £3 7s. 6d.

SAMUELS (Edward A.) Our Northern and Eastern Birds, containing Descriptions of the Birds of the Northern and

Eastern States and British Provinces, together with a History of their Habits, times of Arrival and Departure, their Distribution, Food, Song, Time of Breeding, and a careful and accurate Description of their Nests and Eggs, with a supplement from Holder's 'American Fauna,' with 30 plain and 5 coloured plates, and numerous engravings, royal 8vo, *cloth*, New York, 1883, £1 5s.

SCLATER (P. L., F.R.S.) A Monograph of the Jacamars and Puff-birds, or Families Galbulidæ and Bucconidæ, 55 very fine coloured plates, with letterpress, the plates drawn by J. G. Keulemans and coloured by hand, royal 4to, in 1 vol., *new half morocco, top edges gilt, uncut*, 1883, £6.

STEARNS (W. A.) New England Bird Life, being a Manual of New England Ornithology, revised and edited from the manuscripts of W. A. Stearns by Elliot Coues, with numerous engravings, 2 vols. (Vol. I., Oscines; Vol. II., Non-oscine Passeres, Birds of Prey, Game and Water Birds), 8vo, *cloth*, Boston, 1881-83, £1 5s.

THOMPSON (Wm.) The BIRDS of IRELAND, Vol. I., Raptores and Insessores; Vol. II., Rasores and Grallatores; Vol. III., Natatores; 3 vols., 8vo, *cloth*, 1849-51, £2 10s.

'An excellent work, full of novelty and interest; a Cyclopædia of the Habits of Birds of Ireland.'—*Athenæum*.

YARRELL (W.) History of British Birds, 4th Edition, revised by Prof. Newton and H. Saunders, 564 engravings, 4 vols., 8vo, *cloth*, 1871-74 (pub. £4), £3 7s.

PHYSICAL SCIENCE.

Astronomy, Geology, etc.

BAILY (Francis) Astronomical Tables and Formulæ, together with a variety of Problems explanatory of their use and application, to which are prefixed the Elements of the Solar System, 8vo, *boards*, 1827, 17s. 6d.

CHAMBERS (G. F.) Handbook of Descriptive Astronomy, 3rd edition, with 34 plates, 8vo, *cloth*, 1877, £1 4s.

DE MORGAN (Augustus, F.R.A.S.) Budget of Paradoxes (reprinted, with the Author's Additions, from the *Athenæum*), large 8vo, *cloth*, scarce, 1872, £2 2s.

GILBERT'S DE MAGNETE.—Gvilielmi Gilberti Colcestrencis, Medici Londinensis, De Magnete, magneticisque corporibus, et de magno magnete tellure; Physiologia nova, plurimis et argumentis, et experimentis demonstrata. Londini excudebat Petrus Short, Anno MDC., pp. 14 and 240, numerous engravings of Gilbert's Electrical Experiments, small folio, *old calf*, very scarce, 1600, £5 5s.

GOULD (B. A.) Resultados del Observatorio Nacional Argentino en Cordoba. Uranometria Argentina; Brightness and Position of every Fixed Star down to the Seventh Magnitude within 100 degrees of the South Pole, text, 4to, 388 pp., and atlas, folio, containing 14 Star Charts (forming Vol. I. of the Resultados), in English and Spanish, Buenos Aires, 1879 £4 4s.

GOULD (B. A.) Resultados del Observatorio Nacional Argentino en Cordoba. Vols. VII., VIII., Zone Catalogue,

Mean Positions of the Stars observed in the Zones at the Argentine National Observatory, with Introduction and Precession Tables, 2 vols., 4to, 879 pp., Buenos Aires, 1884, £2 10s.

HERSCHEL (Sir J. F. W.) Results of ASTRONOMICAL Observations made during the years 1834-38 at the Cape of Good Hope, being the completion of a telescopic survey of the whole surface of the visible heavens, with frontispiece and 8 plates, royal 4to, *cloth*, scarce, 1847, £2 2s.

LA TOUCHE (J. D.) Geology of Shropshire, with 823 engravings, 4to, *cloth*, 1884, 15s.

NASMYTH (James, C.E.) and James CARPENTER, F.R.A.S., The Moon: considered as a Planet, a World, and a Satellite, with 24 photographic plates of Lunar Objects, Phenomena, and Scenery, numerous woodcuts, 4to, *cloth*, 1874, very scarce, £4 4s.

PETERS (Dr. C. H. F.) Celestial Charts for the Equinox, 1860, made at the Litchfield Observatory, Hamilton College, New York (last comparison with the sky in 1882), 1st series, 20 maps, folio (22 inches by 16 inches), £3 3s.

PRICE (Bartholomew, F.R.S.) Treatise on Infinitesimal Calculus: Vol. I., Differential Calculus; Vol. II., Integral Calculus, Calculus of Variation, and Differential Equations; Vol. III., Statics and Dynamics of Material Particles, with 10 plates, 3 vols., 8vo, *cloth*, last edition, Oxford, 1857, 1865, and 1868, £1 17s. 6d.

SCHMIDT (Dr. J. F. Julius) Charte der Gebirge des Mondes nach einigen beobachtungen in den Jahren 1840-74, 25 sections of the Moon, each royal folio, in portfolio, with text, over 300 pp., 4to, *boards*, 1878, £2 12s.

SMYTH (Captain William Henry) A CYCLE OF CELESTIAL OBJECTS, Vol. I., Prolegomena, 516 pp., with about 50 engravings; Vol. II., the Bedford Catalogue, 560 pp., with about 60 engravings of nebulae, etc., 2 vols., 8vo, *cloth, uncut*, scarce, 1844, £3 3s.

This is the original and best edition. The reprint (1881) contains the Bedford Catalogue; that is *one* volume only of the Cycle.

SOWERBY (J.) British Mineralogy, 550 coloured plates, with descriptions of the Minerals of Great Britain, 5 vols., royal 8vo, *half-calf*, 1804-17, £6.

SUSSEX.—The Geology and Fossils of the Tertiary and Cretaceous Formations of Sussex, by the late FREDERICK DIXON, Esq., F.G.S.; new edition, revised and augmented by T. RUPERT JONES, F.R.S., F.G.S., aided by PROFESSOR OWEN, C.B., Sir P. de M. Grey-Egerton, Bart., M.P., Prof. T. Bell, F.R.S., W. Carruthers, F.R.S., T. Davidson, F.R.S., R. Etheridge, F.R.S., J. Evans, F.R.S., Prof. J. Morris, F.G.S., E. T. Newton, F.G.S., W. J. Sollas, F.G.S., Henry Woodward, F.R.S., T. Wright, F.R.S., and others, pp. 24 and 462, with Geological Map and Section of Borings, also 64 sheets of fine plates of Fossils, including a selection from those published in 'Mantell's Fossils of the South Downs,' new edition, royal 4to, *cloth*, Brighton, 1878, £2 15s.

WADSWORTH (M. E.) Lithological Studies—A Description and Classification of the Rocks of the Cordilleras, with 8 plates, containing 48 coloured sections, 4to, Cambridge, U.S., 1884, £1 10s.

The plates are beautiful microscopical enlargements of thin sections of the rocks.

Fifteenth Year of Publication.

THE

NATURAL HISTORY AND SCIENTIFIC
BOOK CIRCULAR:

CONTAINING

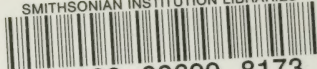
IMPORTANT WORKS ON NATURAL HISTORY
AND SCIENCE.

NATURAL HISTORY AND SCIENTIFIC BOOK CIRCULARS recently published, each post free on receipt of the price.

- No. 61.—BOTANY: Recent Purchases and New Works: Flowering Plants, British Botany. Foreign and Local Floras. Ferns, Mosses, Fungi, Lichens, Algæ. Herbals and Ancient Botany. Economic Botany: Fruit-Trees, Gardening, Orchids, Tea-Culture. Trees and Forestry. Entomology. 32 pp. Price 2d.
- No. 62.—THE OCEAN; FISHES, MOLLUSCA, SHELLS, CRUSTACEA, FORAMINIFERA. Seals, Whales, Reptiles. Zoology: Entomology, Mammalia, Ornithology. General Natural History, Voyage, and Travel. Botany. 32 pp. Price 2d.
- No. 63.—GEOLOGY, MINERALOGY, MINING, AND PALÆONTOLOGY. Also Works on Botany, Conchology, Entomology, Fishes, Birds, Mammalia. 32 pp. Out of print.
- No. 64.—ASTRONOMY, MATHEMATICS, ELECTRICITY, GRAVITATION, ACOUSTICS, AERONAUTICS. Heat. Light, Optics. Meteorology, Chemistry, Microscopy. 48 pp. Price 2d.
- No. 65.—BOTANY, CONCHOLOGY, ENTOMOLOGY, FISHES, MAMMALIA, ORNITHOLOGY, ASTRONOMY, CHEMISTRY, ELECTRICITY, GEOLOGY, MATHEMATICS, OPTICS, METEOROLOGY. 48 pp. Price 2d.
- No. 66.—ENTOMOLOGY, MISCELLANEA ENTOMOLOGICA, COLEOPTERA, LEPIDOPTERA, HYMENOPTERA, ORTHOPTERA, DIPTERA, HEMIPTERA, NEUROPTERA. Price 2d.

W. WESLEY AND SON, 28, ESSEX STREET, STRAND.

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00699 8173

